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DISEASES CAUSED BY BACTERIA AND FUNGI.

BENDIXEN, H. C., & MINETT, F. C. (1938). **Excretion of *Streptococcus pyogenes* in the Milk of Naturally Infected Cows.**—*J. Hyg., Camb.* **38.** 374-383. 2 figs. on 1 plate, 2 tables. [6 refs.]

Two cows, discovered to be excreting *Str. pyogenes* [group A, Lancefield] in the milk and proved to be concerned with milk-borne outbreaks of tonsillitis or scarlet fever at Morkov (Denmark) and Doncaster (England) respectively, were purchased by the authors and kept under close observation. The Morkov cow excreted *Str. pyogenes* from the affected quarter up to the time she was slaughtered, *viz*, for at least 13 months, including a dry period of about 3 months, while in the Doncaster cow the two fore-quarters were acutely infected and excretion of streptococci continued for 6 weeks. In both cases the streptococcus count in the milk was high at times and in both there were stages when symptoms of mastitis were either not evident or not pronounced, although the milk was known to be infective.

I. STABLEFORTH, A. W. (1937). **Serological Types of *Str. agalactiae* (Streptococcus Group B) in this and other Countries.**—*J. Path. Bact.* **45.** 263-277. 12 tables. [6 refs.]

II. STEWART, D. F. (1937). **Group Classification and Serological Typing of Streptococci Associated with Bovine Mastitis in Australia.**—*Ibid.* 279-293. 6 tables. [Numerous refs.]

I. It is shown that most British strains of *Str. agalactiae* (Streptococcus Group B) fall into five serological divisions by agglutinin-absorption tests, and that these fall into three main types, of which two contain related sub-types, *viz*, 1a, 1b, 2a, 3a and 3b respectively. (Types now called 1a, 2a and 3a were originally called types a, b and c respectively, but are re-designated for reasons given). The

relation of these types and sub-types in direct slide agglutination tests and in precipitin tests is shown and discussed ; there is little cross-reaction between main types, but considerable cross-reaction between sub-types. Precipitin absorption tests, both with whole bacteria and extracts, readily distinguish the main types, but not related sub-types.

Of 33 strains of *Str. agalactiae* isolated in certain European countries, 13 fell into British sub-type 1a, and 14 into sub-type 2a ; four others were also of main type 1, whilst two strains apparently had no likeness to any of the British types. No type 3 strains were present. The incidence of sub-type 2a was much greater than is the case among British strains.

Reciprocal tests with sera and strains for the British sub-types and the types of LANCEFIELD's group B (*Str. agalactiae*) [*V. B.* **4.** 199.] showed that her sub-types Ia and Ib are distinct from the British types and, in the author's hands, from each other. Her type II apparently corresponds to British main type 1 ; the type strain V9 is closely allied to British type 1a, including one-sided absorption, but is not identical. Her type III apparently corresponds with British type 3.

The relation of British, American (U.S.A.) and Australian types so far distinguished is discussed and a scheme is put forward showing this and setting out a new series of designations which it is hoped will facilitate the development of further knowledge regarding the distribution, incidence and pathogenicity of the various types.

Certain strains from abroad proved to belong to the groups II and III recognized among British mastitis strains other than *Str. agalactiae.*

Attention is drawn to the fact that, though all strains of *Str. agalactiae*—and probably most of those called *Str. mastitidis*—fall into " streptococcus group B " on the basis of group precipitin tests, certain strains labelled *Str. mastitidis* and therefore generally regarded as similar to *Str. agalactiae* do not fall into this group. These strains have also certain biochemical characters not regarded as characteristic of *Str. agalactiae* by European workers.

II. S. examined biochemically, group-serologically and type-serologically, the characters of a series of 72 strains of streptococci isolated in Australia from cases of bovine mastitis. Fifty-one strains were shown by biochemical and group precipitin tests to correspond to the Group I mastitis streptococcus of MINETT, STABLEFORTH and EDWARDS [(1929). *J. comp. Path.* **42.** 213.], STABLEFORTH [*V. B.* **3.** 586.], EDWARDS [*V. B.* **2.** 588.] and to LANCEFIELD's streptococcus Group B [*V. B.* **4.** 199.], *i.e.*, *Str. agalactiae.* Twenty-one other strains were shown by group precipitin tests to be of the same nature.

Of the 72 Australian strains of *Str. agalactiae*, 63 were classified into three serological types which, following the scheme of classification of British strains, are called type 1c (27 strains), type 1d (11 strains) and type 3c (25 strains). Another tentative type contained two strains.

Two of the types described, *viz*, 1d and 1c, were related to the British main type 1, and one, *viz*, 3c, to the British main type 2, but none was found to be identical with any British type. One type, *viz*, 1c, was found to be identical with V9, the type III mastitis strain described by LANCEFIELD.

STABLEFORTH, A. W. (1938). **The Incidence of the Various Serological Types of *Str. Agalactiae* in Herds of Cows in Great Britain.**—*J. Path. Bact.* **46.** 21-29. 2 tables. [3 refs.]

A study of serological types of *Str. agalactiae* isolated from 782 cases of mastitis in 52 British herds showed that type 1 occurred in nearly two thirds of

the herds, and sub-types of type 3 in approximately one third. Type 2 appears to be relatively rare [see above].

With regard to haemolytic activity, it was found that 74% of all the infected cows carried pure β-haemolytic streptococci and 23% pure non-haemolytic organisms, only 3% having mixed infection.

It is the author's present practice to use the slide agglutination method of identifying *Str.a.* in place of biochemical methods formerly used. The procedure is outlined.

S. discusses his findings, and points out that pure type infections predominate, and tend to remain pure in herds and animals over long periods. Type 3 streptococcus spreads more quickly in herds than the other types.—H. Burrow.

Gwatkin, R., Hadwen, S., & LeGard, H. M. (1937). **Bovine Mastitis. Notes on Incidence, Aetiology and Diagnosis.**—*Canad. J. comp. Med.* **1.** No. 3. 7-16. 1 table. [17 refs.]

The authors first discuss the economic importance of mastitis, its aetiology and methods of diagnosis. Next they tabulate the results obtained from examinations of a total of 648 cows. There were 256 cases of mastitis, 185 being due to streptococci, 56 to staphylococci, 10 to *Bact. coli*, and 5 to *Corynebact. pyogenes*. Cultures failed to demonstrate the causal organism in 9·1% of the cases. Bromthymol blue and rennet coagulation tests together were negative in 25·5% of these cases, while clinical examination failed to detect 20·7% of the cases determined by the combined methods. The percentage of infection in multipara was higher than in primipara; 31·7% of the 265 cases were infected in all quarters; in cases where only single quarters were involved, hind-quarter infections were greater than those of the fore quarters.—L. B.

Anon. (1937). **Hotis Test for Mastitis.**—*Canad. J. comp. Med.* **1.** No. 2. 32.

This test, which has been introduced recently, is carried out by adding 0·5 c.c. of a sterile 0·5% aqueous solution of bromcresol purple to 9·5 c.c. of milk in a sterile test tube. The tube is inverted several times and incubated for 24 hours at 37°C. The presence of streptococci is indicated by a colour change, from purple to yellow or green. It is emphasized that this test may prove useful, but that, like all other diagnostic procedures, it must only supplement clinical examination.

—Chas. A. Mitchell.

Mitchell, C. A., Walker, R. V. L., & Humphreys, F. A. (1937). **Studies in Streptococcic Mastitis. Comparison of Several Diagnostic and Test Methods.** —*Canad. J. comp. Med.* **1.** No. 2. 15-25. 5 tables. [2 refs.]

The authors compare the efficiency of the diagnostic methods now in use for detecting animals infected with streptococcal mastitis. They classify these methods roughly into three groups :– (1) clinical examination; (2) bacteriological examination for *Str. agalactiae*, and (3) examination of the milk for (a) physical changes, and (b) chemical changes. The criteria used in determining infected and suspicious animals are then presented, with the procedure for the clinical examination, the indirect tests (bromthymol blue, catalase and chloride) and the bacteriological examination. Tabulated data show the results of these tests as applied to a representative herd of 127 animals. The work suggests that the most accurate method of diagnosis is by clinical, together with bacteriological examination; when this is not possible the best procedure is a combination of the clinical examination and the three indirect tests.—Chas. A. Mitchell.

I. Johns, C. K., & Hastings, E. G. (1938). **Concerning the Use of Indirect Biochemical Tests for the Diagnosis of Chronic Contagious Mastitis.**—*Canad. J. Res.* Sect. D. **16.** 6-14. 8 figs. [3 refs.]

II. Johns, C. K., & Hastings, E. G. (1938). **The Relation between Bacterial Numbers and Biochemical Values in Milk from Streptococcus-Free Quarters.**—*Ibid.* 15-30. 8 figs., 2 tables. [9 refs.]

I. The authors examined samples taken at consecutive milkings to determine the reliability of indirect biochemical tests (chlorides, catalase and pH) for detecting chronic contagious mastitis. The discovery that infected quarters frequently yield normal milk and healthy quarters milk of abnormal appearance, together with the fact that reactions may fluctuate widely at different milkings for both infected and non-infected quarters, cause them to urge caution in the use of these tests as the basis for diagnosing mastitis. The value of examining a series of samples at consecutive milkings, in order to obtain a true indication of the condition of the quarter, is emphasized. Of the three tests studied, the authors suggest the catalase test as being the most sensitive indicator of infection.

II. In an attempt to determine if abnormalities in the composition of the milk from streptococcus-free quarters are due to bacterial infection, it was found that the relation between bacterial numbers and abnormal composition of the fore milk is not a simple one.

Readings of biochemical tests that indicate infection may accompany low counts or high counts may exert no apparent influence on the composition of the milk. No one type of organisms appears to be associated with changes in the composition of the secretion, and it is possible that a second agent in addition to bacteria might be involved.—L. B.

Eschenbach, W. (1937). Leukozytenbefunde in Einzel- und Bestandsgemelken aus galtverseuchten Rinderbeständen. [**Leucocytic Findings in the Individual and Mixed Milk of Herds with Mastitis**].—*Inaug. Diss., Berlin.* pp. 40. 18 tables. [Numerous refs.]

Using the sedimentation method of Lerche and the direct method, E. examined samples of milk from cows with mastitis. Milk from affected cows showed at least three leucocytes in each microscopic field by the direct method and 90-100 leucocytes by the sedimentation method. The recognition of small or large clumps of leucocytes is further evidence of mastitis, but the leucocytes in these clumps are so close together that it may be difficult to make out the individual nuclei. They usually contain phagocytosed streptococci. It is not always possible to detect the admixture of affected milk to a bulk sample, but if there are more than three leucocytes per microscopic field when examined by the direct method and 90-100 when examined by the sedimentation method, E. considers that the sample contains at least 20% of affected milk.—J. A. Nicholson.

I. Ramon, G., & Staub, A. (1937). A propos de la vaccination charbonneuse. Sur une nouvelle méthode de vaccination des animaux domestiques contre le charbon. [**A New Method of Vaccination of Domestic Animals against Anthrax**].—*Bull. Acad. Méd. Paris.* **117.** 299-310. 1 table. [7 refs.]

II. Pigoury. (1937). Vaccination anticharbonneuse du cheval par la méthode intradermique en un temps. [**Intradermal Single Dose Vaccination of Horses against Anthrax**].—*Bull. Acad. vét. Fr.* **10.** 287-296. 1 table. [15 refs.]

I. Pasteur's classical method of anthrax vaccination has not escaped criticism, and in order to improve upon it, the authors tried various modifications which had

been successfully applied in the preparation of other vaccines. Finally, they found that by incorporating a suspension of anthrax spores, corresponding in attenuation to Pasteur's first vaccine, in 0·2 % agar, and 1-3 % alum, a very efficient vaccine could be prepared. Sheep injected subcutaneously with a single dose of 0·25 c.c. developed an immunity as early as the fifth day, and this afforded protection for at least eight months. Lanoline was also tried as an excipient, but although an efficient immunity developed, it was not convenient in practice.

II. P. gives his opinion on the single intradermal method of vaccinating horses against anthrax, having vaccinated over 63 thousand horses by this method. He states that the duration of immunity is about one year, but that it tends to diminish after the ninth month, and that in this period a few losses may occur. Vaccination should be repeated annually. In his experience, the single intradermal method gives better results than double inoculation.

In the second part of the paper he explains why the few occasional deaths following vaccination can be attributed to natural infection. Immunity to this vaccine does not develop until the seventh day after vaccination in horses ; it occurs more rapidly in sheep.—GWILYM O. DAVIES.

RIVADELO, T. F. (1937). **Field Experiences in the Use of Biologics against Bovine Anthrax.**—*Philipp. J. anim. Indust.* **4.** 461-471. 1 table. [2 refs.]

The history of anthrax immunization in the Philippines is reviewed. The various inoculations used are serum alone, serum and vaccine, and the triple treatment, which consists of the second method followed at two intervals of 10-14 days by vaccines Nos. 3 and 4 (said to be virulent for rabbits and for sheep respectively). " Carbozoo ", " charbonol " (a proprietary preparation) and a spore vaccine prepared locally have also been employed. The serum-vaccine method was the first to be generally used ; more recently the spore vaccines have appeared to give equally satisfactory results with fewer complications.—R. FISHER.

I. REITER. (1937). Sur la réglementation visant à prévenir la tuberculose chez les jeunes animaux en Allemagne. [**Regulations to Prevent TB. of Young Animals in Germany**].—*Bull. Off. int. Hyg. publ.* **29.** 1656-1658.

II. ROBERTSON, A. N. (1937). Sur la réglementation tendant à prévenir la tuberculose des génisses en Australie. [**Regulations to Prevent TB. in Heifers in Australia**].—*Ibid.* 1659.

III. COFFEY, D. J. (1937). La tuberculose bovine dans l'état libre d'Irlande. [**Bovine TB. in the Irish Free State**].—*Ibid.* 1660-1661.

IV. JAMES, S. P. (1937). Sur la tuberculose bovine en Nouvelle-Zélande. [**Bovine TB. in New Zealand**].—*Ibid.* 1662-1664. 2 tables.

V. CHODZKO, W. (1937). La lutte contre la tuberculose des bovidés en Pologne. Observations générales. [**Control of Bovine TB. in Poland**].—*Ibid.* 1665-1678. [Numerous refs.]

I. R. outlines the steps taken in Germany to check the spread of bovine TB. :- the obligatory notification of TB. of the lungs, udder, uterus or intestine under the Reichstierseuchengesetz of 1909, and the Ostertag voluntary scheme.

II. As the incidence of bovine TB. in Australia does not exceed 8 %, and as cases of open TB. are rare, no special regulations for its control have been enforced. Large scale tuberculin testing is being carried out.

III. No comprehensive investigation into the incidence of bovine TB. in Ireland has been made, but it is thought to be low, as the cattle are chiefly stores

kept at pasture nearly all the year round, and stall-confined dairy herds are few. Premium bulls have to be certified free from TB. as indicated by the tuberculin test. Tuberculin testing of dairy herds is being developed at present. There is an organization for the collection and PM. utilization after slaughter of old cows and all bovines of poor health (piners), for which the government pays £2.10.0 a head.

IV. Bovine TB. is not prevalent in New Zealand. During the year 1935-1936, 14,423 cows were tuberculin-tested and 7·9% reacted; in 500 of the latter examined after slaughter not one case of udder TB. was found. Abattoir statistics for the period 1925-1936 show that the percentage of TB. varied between 5 and 6·5. Of 2,431 milk samples examined since 1930 only 30 (1·23%) were infected with the tubercle bacillus. Bovine type TB. in man is relatively rare in New Zealand.

V. The control of bovine TB. in Poland is based on a presidential decree of August 22nd, 1927, which ordered the notification of infectious diseases of livestock, including open TB. After notification, the animal in question is examined by a state veterinary inspector, who advises the local magistrate in cases where slaughter is indicated. The decree also orders the destruction of tuberculous milk. By an order of the Minister of Agriculture of January 9th, 1928, when a case of open TB. has been found, all the animals in the herd must be examined by the district veterinarian or by a practitioner who has previously been approved by the ministry to carry out work for agricultural unions. A voluntary TB. eradication scheme was started in 1928 by which farmers formed themselves into a union, pledging themselves :– to have all their cattle clinically examined every six months by a practitioner appointed by the union and approved by the departmental (local) government; to have a bulk milk sample from each herd examined for tubercle bacilli once a year, and to separate new-born calves from their dams not later than 14 days after birth. If the bulk milk sample is infected, the cow concerned is traced and removed. Raw milk from cows known to be TB.-free is allowed for calves. The cost of this work is borne by the animal owners.

In February, 1936, a more intensive eradication scheme was started in pedigree herds, six-monthly clinical examinations and tuberculin tests being carried out at the cost of the state, and each year detailed instructions for the campaign of the succeeding year are issued by the Ministry of Agriculture. Those for 1936 are given in full: they follow orthodox lines for the separation of infected and non-infected animals, and for the building up of clean herds. The tuberculin test prescribed is the intradermal " réitérée " [? double injection as used in Great Britain].

The last five pages of the article contain a review of the literature on bovine type TB. in man in various countries, among which the following information on Poland is given :– the percentage of TB. in cattle slaughtered at Warsaw abattoir varied between 11 and 7·8 during the years 1927-1930, and 51% of milk samples collected at Warsaw market in 1933 were tuberculous; the figures for other lots of samples from Warsaw and Poznan were 19·4% and 33·3% respectively.—J. E.

NÈGRE, L. (1934). Le bacille tuberculeux et les matières grasses. [**The Importance of Fat for the Growth of Tubercle Bacilli**].—*Mém. Prof. Jean Cantacuzène.* pp. 545-549. [16 refs.]

Experiments performed by N. and his colleagues are enumerated, stressing the increased pathogenicity of tubercle bacilli in the presence of fatty substances such as olive oil, cod liver oil, acetone extracts of lung, liver, and spleen, and of tubercle bacilli.—R. O. MUIR.

I. Steiner, M., Greene, M. R., & Kramer, B. (1937). **The Effect of Vitamin A Deficiency on Experimental Tuberculosis in the Guinea Pig and Rabbit.** —*Amer. Rev. Tuberc.* **36.** 222-238. 5 tables. [16 refs.]

II. Smithburn, K. C. (1937). **Virulence of Bovine Tubercle Bacilli. Variations Depending on the pH of the Culture Medium.**—*Ibid.* 637-658. 7 tables. [Numerous refs.]

III. Smithburn, K. C. (1937). **Histopathology of Experimental Tuberculosis. The Lesions Induced by Bovine Tubercle Bacilli of Varying Degrees of Virulence.**—*Ibid.* 659-672. 17 figs. on 3 plates. [7 refs.]

IV. Carvalho, A., Vidal, C., & Rocheta, J. (1938). Sur la virulence du bacille de Koch dans les matières fécales. [**The Virulence of Tubercle Bacilli in Faecal Material**].—*C. R. Soc. Biol. Paris.* **127.** 246-248. [5 refs.]

I. The authors compare the effects of vitamin A-deficiency on tuberculous and non-tuberculous g. pigs and rabbits; vitamin A-depleted g. pigs suffer a significant loss in body weight, and are short-lived. The development of TB. is not appreciably accelerated in vitamin A-deficient g. pigs. nor does TB. further reduce the weights or the period of survival in such animals. Vitamin A-deficient rabbits are stated to develop slightly more extensive TB. lesions in the lung than do control animals.

II. As an illustration of the influence of pH on the virulence of bovine tubercle bacilli, the author shows that a pH of 6·0 yields a maximum of attenuated R colonies, while a pH of 6·8 yields a maximum of virulent S colonies. Intracerebral inoculation of g. pigs of uniform size is proposed as an excellent method for the biological titration of virulence. The weights of the lungs and spleen are considered good indices of the extent of lesions in uncomplicated experimental TB.

III. A histological study is presented of the lesions caused by strains of bovine tubercle bacilli, differing in virulence as a result of cultivation at various pH values. The most virulent cultures produced invasive, necrotic lesions and the least virulent formed circumscribed, non-invasive simple tubercles. Cultures of intermediate virulence induced the formation of both types of lesion and in the opinion of the author indicated that colonies intermediate between R and S are not distinct types, but mixtures of these elements.

IV. It is shown that in cases of human pulmonary TB., coughed-up sputum swallowed and excreted in the faeces is unaffected by the passage through the intestines.—R. O. Muir.

I. Lange, B. (1937). Tierexperimentelle Untersuchungen zur Frage nach der Bedeutung von Superinfektion für Entstehung und Verlauf tuberkulöser Krankheitsprozesse. [**Effect of Superinfection on the Development and Course of TB.**]—*Z. Tuberk.* **77.** 249-269. 4 tables. [13 refs.]

II. Schumann, P., & Fritzsche, K. (1938). Beitrag zur enterogenen Tuberkulose-Infektion des Kalbes. [**Enterogenous TB. in Calves**].—*Berl. tierärztl. Wschr.* Feb. 11th. 77-81. 1 fig. [10 refs.]

I. A record of experiments carried out over a period of several years on sheep and g. pigs in which the effect of a second infection with tubercle bacilli on a pre-existing, healed, primary infection was studied. In order that the results of animal experiments might to some degree approximate to the conditions met in man, it was important that the primary lesions should be quiescent, and not progressive as in most experiments previously recorded.

The sheep (29 animals) had been infected several months or years previously by intratracheal or intravenous injection with virulent bovine tubercle bacilli. When the second dose was given they were all clinically healthy. Superinfection

was produced by intratracheal injection, feeding, or intravenous injection either of bovine tubercle bacilli, or, in some cases, of virulent human tubercle bacilli, doses varying between 10^{-7} mg. and 10 mg.

In general, it was found that reinfection was without effect on a pre-existing primary infection if the organisms were given by a natural route ; if given intravenously, they caused acute generalized TB., the presence of a primary focus conferring no resistance in this case. It should be noted that, in man, there is usually a considerably longer interval between primary infection and reinfection than in the case of the sheep used in these experiments. The animals were well fed and kept under excellent hygienic conditions.

Similar results were obtained in g. pigs. The primary lesions were produced by intradermal injection of a strain of bovine tubercle bacilli and were followed by several injections at a later date, the interval between primary infection and reinfection varying from 107 to 629 days. There was no evidence that the superinfection exerted an unfavourable influence on the course of the primary infection.

In man, the course of the primary infection depends as much on the natural individual resistance of the host and on environmental factors as on exogenous reinfection : L. considers that superinfection is of relatively small importance.

II. Four three-day-old calves from young, tuberculin-negative cows were used for these experiments. Two calves received milk from a cow with tuberculous mastitis, for 8 and 14 days respectively. The milk fed to the first calf showed large numbers of tubercle bacilli in smears. Respiratory symptoms developed 14 days after the first dose of tuberculous milk, and at the end of a month the general condition was very poor and the animal's temperature was 106°F. P.M. revealed primary TB. of the tonsils and intestine and their lymph nodes, and of the lungs and bronchial and mediastinal lymph nodes, with early generalization. The second calf received tuberculous milk in which tubercle bacilli were demonstrable only by g. pig inoculation. When 35 days old the calf was killed and showed primary TB. of the tonsils and intestine with their associated lymph nodes, no other tuberculous lesions being present.

The third calf received a single dose of two litres of the highly infected tuberculous milk by stomach tube when three days old. At autopsy 31 days later there was primary isolated TB. of the ileum and associated mesenteric lymph node. The fourth calf was given a single dose of the lightly infected tuberculous milk and was killed 31 days later. This calf alone gave a negative intradermal tuberculin test prior to slaughter. No macroscopic lesions of TB. were found, but histological examination showed a few productive tubercles in a mesenteric lymph node.

—E. G. White.

I. Opie, E. L., & Freund, J. (1937). **An Experimental Study of Protective Inoculation with Heat Killed Tubercle Bacilli.**—*J. exp. Med.* **66.** 761-788. 5 figs., 6 tables. [Numerous refs.]

II. Weissfeiler, J., Morosowa, E. N., & Pesina, E. J. (1937). Pouvoir immunisant de différentes variétés de bacilles tuberculeux. **[Immunizing Power of Different Varieties of Tubercle Bacilli].**—*Ann. Inst. Pasteur.* **59.** 259-281. 6 tables. [Numerous refs.]

I. In a well-controlled series of experiments on rabbits, evidence was brought forward that heat-killed tubercle bacilli significantly increase resistance to infection with virulent tubercle bacilli. The procedure employed in these experiments was the repeated injection of measured quantities of heat-killed tubercle bacilli (intraderm. or subcut.) in rabbits, usually made at intervals of 5-7 days. At the end of the immunizing period the group of vaccinated rabbits received various doses of

a fully virulent bovine strain, and the degree of immunity attained was measured by the survival rate in days compared with a non-vaccinated control group. When infection was produced by 0·001 mg. and 0·0001 mg. of tubercle bacilli, the life of the treated animals was longer than that of controls, although none survived. Protection against tuberculous infection following the administration of heat-killed tubercle bacilli was only slightly less than that given by BCG, but it approximated that of BCG when certain antigens such as horse serum were combined. There was no significant increase in protection following the addition of bacterial antigens and chemical irritants.

II. The authors compared the immunizing value of a BCG strain with ten other varieties of tubercle bacilli, mainly of the BCG S type. Experiments were carried out on 342 g. pigs and 65 rabbits. Immunity was greatest following the inoculation of BCG, and it was found to vary with the age of the culture. The best results were obtained with cultures 10-15 days old. Among the seven S avirulent varieties, the immunizing power of the strains S4 and S5 approximated that of BCG, while strain S48 (Birkhaug) was inferior. Acid-resistant saprophytic strains proved to be of no value ; in fact, the disease following the inoculation of virulent organisms into g. pigs previously injected with such organisms was more severe than in uninoculated controls. It was observed in g. pigs vaccinated with S varieties that a generalized hypertrophy of the lymphatic system developed, whereas there was no such effect following the use of BCG. The immunity following vaccination with doses of 0·1 mg. of BCG lasted for about four months, and after that it was diminished. The superior immunity following the use of BCG vaccine was found to be independent of the persistence of organisms within the tissues.—S. J. Edwards.

I. Schwabacher, H., & Wilson, G. S. (1937). **Vaccination of Mice against Tuberculosis with Killed Cultures and with Living B.C.G.**—*Tubercle, Lond.* **18.** 492-498.

II. Macheboeuf, M., Dieryck, J., & Dieryck, B. (1938). Étude comparative de la réaction phagocytaire des cobayes à l'injection intrapéritonéale de bacilles tuberculeux morts et de bacilles partiellement délipidés (chimio-vaccin). [**Phagocyte Reaction of G. Pigs Injected Intraperitoneally with Dead Tubercle Bacilli and Partially Delipidized Bacilli (Chemovaccine)**]. —*C. R. Acad. Sci., Paris.* **206.** 1058-1060. [1 ref.]

III. Arena, A. R., & Cetrangolo, A. (1937). Transformation d'une souche de bacilles de Koch du type bovin. [**Transformation of a Dysgonic Bovine Strain of Tubercle Bacillus to the Eugonic Type**].—*C. R. Soc. Biol. Paris.* **126.** 831-833. [1 ref.]

IV. Le Guyon, R., & Ernst, J. (1937). Trypaflavine et tuberculose expérimental. [**Trypaflavine and Experimental TB.**]—*Ibid.* 1213-1214. [2 refs.]

I. In six experiments, using 667 mice, vaccination tests were made with 2-20 injections of live BCG suspensions and heat-killed virulent human tubercle bacilli, in doses of one hundred thousand to one hundred million bacilli. The most favourable results, given by a total vaccinating dose of 20 million with an infecting dose of one hundred million bacilli, suggest that in mice vaccination has very limited value.

II. The authors claim that their chemovaccine, prepared by treating live tubercle bacilli with acetone and then with ether, provokes in rabbits a marked resistance to tuberculous infection, due to the fact that delipidization has removed from the bacilli substances toxic to phagocytes.

III. The authors describe a change in the cultural and biological characters of a bovine strain of tubercle bacillus isolated from a pig. During four years' subculture on Löwenstein's medium, growth becomes eugonic with decreased virulence for the rabbit, characteristic of human bacilli.

IV. The utter inefficacy of trypaflavine in the specific chemotherapy of TB. in g. pigs and rabbits was demonstrated by subcutaneous inoculation of live bovine tubercle bacilli, followed by intravenous injections of trypaflavine solution at intervals for three months.—R. O. Muir.

Rosenthal, S. R. (1936). **Focal and General Tissue Responses to an Avirulent Tubercle Bacillus (B.C.G.)**—*Arch. Path.* **22.** 348-372. 15 figs. [Num. refs.]

R. inoculated g. pigs by the intracardial route with BCG, and killed them at intervals between ten minutes and 14 months after inoculation. Histological examinations of the lungs, lymph nodes, liver, spleen, kidneys and heart were made, and blood counts and tuberculin tests were carried out at frequent intervals. By these methods he studied the remote reaction in susceptible tissues, the comparative development of tubercles in different organs, and the humoral responses.

The focal response in the lungs was usually formed of granular leucocytes which had phagocytosed the organisms, whereas in the liver and kidneys, where cells of the R.E.S. had carried out the phagocytosis, the cellular response was histiocytic in type. It would appear that if the organisms were first taken up by histiocytes, a histiocytic reaction occurred, while phagocytosis by granulocytes resulted in the attraction of more granulocytes. Larger numbers of bacilli were usually associated with a granulocyte reaction. Tubercles formed by avirulent organisms rarely showed the sharp demarcation of polymorphs, epithelioid cells, and lymphocytes as seen with virulent tubercle bacilli; giant cells of the Langerhans type were rare; caseation and necrosis did not occur, and restitution was complete.

Regression resulted with an increase of lymphocytes both in the lesion and in the blood; the epithelioids decreased in number, and complete disappearance occurred, usually without fibrosis. It is suggested that although a fibrous capsule may obstruct the spread of infection, it may also retard restitution by preventing the enclosed organisms from being attacked by the host.

A general response occurred in the R.E.S., and this is thought to be due to submicroscopic forms of the organism. Sensitivity to old tuberculin was not observed until long after the formation of tubercles and the R.E.S. response.
—Norman Hole.

Lecompte, M. (1937). La paratuberculose dans le département d'Ille-et-Vilaine. [**Johne's Disease in the Department of Ille-et-Vilaine (France)**].—*Thesis, Alfort.* pp. 71. 1 table, 1 map. [Numerous refs.]

An account of the epidemiology, aetiology, diagnosis and prophylaxis of Johne's disease in cattle. The origin of the disease in Ille-et-Vilaine appears to have been an importation of cattle from Jersey just previous to 1908. Details concerning the preventive inoculation of 33 cattle with an oily emulsion of live bacteria (vaccine of Vallée and Rinjard—*V. B.* **5.** 601.) are given. It is claimed that vaccination is innocuous, and that it gives satisfactory results when combined with the usual hygienic measures for control.—N. J. Scorgie.

I. Drbohlav, J. (1937). La tularémie en Tchécoslovaquie. [**Tularaemia in Czechoslovakia**].—*Bull. Off. int. Hyg. Publ.* **29.** 1905-1917.

II. Arar, A. (1937). La tularémie en Turquie. [**Tularaemia in Turkey**].—*Ibid.* 1918-1923.

I. An epidemic of tularaemia, traced to diseased hares from across the Austrian frontier, is discussed with reference to source, spread, symptoms and control. Serological tests revealed the presence of agglutinins for both *Bacterium tularense* and *Brucella abortus*.

II. An outbreak of tularaemia in Turkey is described, with details of origin, transmission by rodents, serology and control.—R. O. Muir

I. Reeh, H. (1937). Zur patholigischen Anatomie der Paratyphus-Enteritis-Dauerausscheider beim Rind. [**Bovine Carriers of Paratyphoid Bacteria**]. —*Inaug. Diss., Berlin.* pp. 33. 9 figs. [Numerous refs.]

II. Knaden, H. (1937). Untersuchungen im Schlachthof zu Gelsenkirchen gesund geschlachteter Rinder auf Bakterien der Enteritis-Gruppe. [**Examination of Healthy Cattle at the Abattoir at Gelsenkirchen for Paratyphoid Bacteria**].—*Inaug. Diss., Berlin.* pp. 17. [Numerous refs.]

III. Töpke, H. (1937). Uebertragungsversuche von Breslau-bakterien verschiedener Herkunft auf Tauben. [**Transmission Tests with** *Salmonella enteritidis* **Breslau in Pigeons**].—*Inaug. Diss., Berlin.* pp. 48. 1 table. [Numerous refs.]

IV. von Garnier, K. D. (1937). Können sich Enteritis-Breslau-Bakterien in Futtermitteln vermehren? [**Possible Multiplication of** *S.e.* **Breslau in Foodstuffs**].—*Inaug. Diss., Berlin.* pp. 37. [Numerous refs.]

I. Macroscopic and histological examination of the organs from eight cows, known to be " carriers " of salmonella, revealed no specific lesions, though occasionally centres of infection were observed in the liver. The spleen was enlarged due to a great increase in lymphoid cells and histiocytes. The liver and kidneys showed extravasation of lymphoid cells and increase in the fibrous tissue.

II. K. examined culturally the gall-bladders, intestinal lymph nodes and portal lymph nodes of 500 healthy cattle. In no case were any salmonella recovered. *Bacterium coli* and other non-specific organisms were observed on many occasions especially in the gall-bladder.

III. Pigeons are susceptible to oral infection with the Breslau type of bacillus of any origin. Young birds die, but older ones usually recover to remain " carriers ". Agglutinins are seldom found in the blood, but the faeces are infective.

IV. If foodstuffs containing sugar are stored wet, and infected with the Breslau bacillus by mice, rapid multiplication of the bacillus occurs and may cause disease in stock to which it is fed. Dry food is safe, as the bacillus cannot multiply. —P. S. Watts.

Štern, H. (1938). Pokušaj nalaženja Salmonella-bakterija na svinjama zaklanim za potrošnju u Zagrebu. [**The Incidence of Salmonella in Abattoir Pigs at Zagreb**].—*Vet. Arhiv.* **8.** 89-95. [Numerous refs.] [German summary].

The carcasses of two groups of pigs, passed as fit for human consumption, were examined for salmonella using the Kaufmann enrichment medium and ordinary agar respectively, material being taken from the spleen, tonsils, rectal contents and some lymph nodes.

No genuine salmonella were isolated with either medium. The author considers that Kaufmann's medium is not sufficiently inhibitory of *Bact. coli* and " *B. vulgare* " for practical use.—B. Oswald (Križevci).

I. Weber. (1937). Zur Dauerausscheiderfrage in Geflügelbeständen. [**Continuous Excretors of Salmonella on Poultry Farms**].—*Berl. tierärztl. Wschr.* June 4th. 348-349.

II. Stoilowa, Eugenie R. (1937). Die ruhrartigen Hühnererkrankungen im Bezirk Sofia und ihre Bekämpfung mittels bakteriologischer und serologischer Methoden. [**Poultry Paratyphoid in the Sofia Region**].—*Arch. wiss. prakt. Tierheilk.* **72.** 33-39. [Numerous refs.]

I. Twenty-two hens, three turkeys and three Indian ducks on one farm were found to be infected with *Salmonella enteritidis* Breslau. From blood tests carried out it appears that infection dies out spontaneously in hens, but may persist in ducks, which become continuous excretors.

It was found that " water-glass " (a sodium silicate preparation) in a dilution of 1:8 was capable of killing salmonella present on the shells of the eggs in 12 days.

II. S. carried out P.M. and bacteriological examinations on six hens sent in from six different flocks of poultry. The changes observed included serofibrinous peritonitis and pericarditis, enlarged heart, necrotic foci in the muscles and lungs, and swelling of the liver and spleen. In each case *S. gallinarum* was isolated. Flock tests were then carried out by the rapid whole blood agglutination method using Bunyea's antigen prepared from *S.g.* and *S. pullorum*. Positive reactors were further examined and it was found that *S.g.* alone was present. Hens infected with this organism produced chicks which were not infected with either *S.g.* or *S. pullorum*.—Sassenhoff (Munich).

I. Munné, J. V. (1937). Au sujet de la différenciation de *Salmonella pullorum* et *S. sanguinarum*, au moyen d'un bactériophage spécifique. [**The Differentiation of *S. pullorum* and *S. gallinarum* by a Specific Bacteriophage**]. —*C. R. Soc. Biol. Paris.* **126.** 1228-1230. 1 table. [1 ref.]

II. —. (1937). **Seventeenth Annual Report on Eradication of Pullorum Disease in Massachusetts.**—*Control Bull. Mass. agric. Exp. Sta.* No. 88. pp. 11. 5 tables.

I. M. has confirmed Naidu's findings [*V. B.* **6.** 108.] that an anti-*pullorum* bacteriophage only has the power to lyse cultures of *S.p.* and not cultures of *S.g.*

Such a bacteriophage was isolated from the intestinal contents of a chicken with *S.p.* infection, and it was capable of causing complete lysis of a broth culture of *S.p.* in a dilution of one in ten million after eight hours' incubation at 37°C.

II. This report covers the season 1936-1937. It appears that about one sixth of the poultry in Massachusetts—461,762 birds—were blood-tested during the season. 0·37 % were positive to the test. In some counties there were no reactors amongst the birds tested, and in only one county was the percentage of reactors more than 2. The danger of infection by birds returning from laying trials is stressed.

The eradication programme is making good progress.—D. L. Hughes.

Edwards, P. R. (1938). **A New Salmonella Type**: *Salmonella kentucky.—J. Hyg., Camb.* **38.** 306-308. [1 ref.]

E. has isolated an organism of the salmonella group from intestinal ulcers in a chick affected with coccidiosis and ulcerative enteritis.

Acid and gas were produced in glucose, maltose, rhamnose, trehalose, arabinose, dulcitol, sorbitol, and inositol; lactose and sucrose were not attacked. Hydrogen sulphide was formed.

It was found on antigenic analysis that the organism possessed somatic factor VIII, but not factor VI of *S. newport*. However, it possessed a hitherto undescribed

somatic factor which has been labelled XX. The floccular antigens are of two types, both specific. One of these is the same as factor i. of *S. typhi-murium*, the other is unrelated to any known specific factor in the group, and has been called 26. This is another example of the alpha-beta phase variation originally described by Kaufmann and Mitsui [(1930). *Z. Hyg. InfektKr.* **111.** 740-745].

The antigenic formula of *S. kentucky* is VIII. XX : i-26.—D. L. Hughes.

I. Fitch, C. P., Boyd, W. L., & Bishop, Lucille M. (1938). **A Study of the Vaginal Content of Pregnant Bang-Infected Cows for the Presence of Brucella abortus.**—*J. Amer. vet. med. Ass.* **92.** 171-177. [10 refs.]

II. Donham, C. R. (1938). **Some Phases of the Control of Bang's Disease.**—*Vet. Med.* **33.** 118-120. 2 figs.

I. Observations on the persistence of *Br.a.* in the vaginas of Bang-infected pregnant cows including cows with affected placentas, some of which aborted and some of which calved at full term.

Repeated examination of vaginal swabs taken in the course of this investigation, and submitted to g. pig inoculation, showed that, unless a vaginal discharge is present, *Br.a.* is not found in the vaginas of infected cows until the uterine seal is broken [see also *V. B.* **1.** 273].

II. Three types of indecisive agglutination reactions are discussed, occurring in recently infected animals, in those carrying an infection of long standing, and in those showing a non-specific agglutination at low titres. The necessity for correlating aggl. tests with field observations is stressed. The minimum and maximum incubation periods of Bang's disease are assessed as 2 weeks and several months respectively.—H. Burrow.

Gromyko, A. I. (1937). O brucelle ze seryh krys. [**Brucellosis of Grey Rats**]. —*Sovyet. Vet.* No. 8. pp. 71-73. 1 table.

The course of the disease was shown to be mild. Experimental infection with *Br. abortus* culture fed in milk and also injected (subcut.), or into the conjunctiva, or by scarification, gave rise to positive agglutination reactions from 1 : 25 to 1 : 1,000. Application of infective material to intact skin and contact of test animals with infected rats gave negative results.

Br.a. was grown from the liver and spleen of an infected rat and used orally for test infection of cats, G. mentioning that little is known of brucellosis in the latter animals. Aggl. reactions were positive, but a bacteriological test P.M. was negative.

Rats found in the vicinity of cattle susceptible to the disease should be exterminated.

Evans, Alice C. (1937). **Studies on Chronic Brucellosis. I. Introduction. II. Description of Technique for Specific Tests.**—*Publ. Hlth Rep., Wash.* **52.** 1072-1077 and 1419-1427. 6 figs. on 1 plate, 1 table, 1 chart. [Num. refs.]

Poston, Mary A. (1938). **Studies on Chronic Brucellosis. III. Methods Used in Obtaining Cultures.**—*Ibid.* **53.** 1-4. 2 tables.

I. An introduction to a series of studies of chronic brucellosis in human beings in connexion with surveys conducted in three widely separated sections of the United States. The need for such investigation is based on the obvious possibilities of infection and the occurrence of chronic brucellosis, which in many cases remains undiagnosed.

II. The tests used to aid in diagnosis of chronic brucellosis in human beings were the agglutination, opsono-cytophagic and intradermal reactions. The

technique used and some newly introduced modifications are described in detail. The injection of brucellin was frequently followed in human subjects by a development or increase of opsonins and agglutinins.

III. Cultures and g. pig inoculations were made from the blood of 14 human patients suspected of chronic brucellosis. None of these patients had reacted to specific tests. Five proved positive to g. pig inoculation, and three, to blood culture. Three of the strains were identified as *Br. melitensis*, one as *Br. suis*, and one as *Br. abortus*. The g. pigs were examined for positive agglutination and brucellin reactions before being killed, and examinations were continued for 4½ months. Agglutinins did not appear in the reacting g. pigs until the eleventh to the sixteenth week.—S. J. Gilbert.

I. Welsch, M., & Demelenne-Jaminth, G. (1937). La fièvre ondulante en Belgique. [**Undulant Fever in Belgium**].—*C. R. Soc. Biol. Paris.* **126.** 1257-1259. [2 refs.]

II. Menton, J. (1937). **Brucellosis in Man and Animals in Staffordshire. Laboratory Observations.**—*Brit. med. J.* Dec. 25th. 1273-1275. 4 tables.

III. Gatt, J. E. H. (1938). **Undulant Fever in Malta.**—*Ibid.* Feb. 26th. 454. 1 table.

IV. Pérès, G. (1938). Observations sur la contagiosité de la melitococcie. [**Contagiousness of *Brucella melitensis* Infection in Goats**].—*Rev. Méd. vét., Toulouse.* **90.** 39-41. [1 ref.]

I. Undulant fever has been little studied in Belgium, although 10% of the cattle there are said to be infected with *Br. abortus*.

Of 1,300 human sera tested within three months against a suitable antigen seven (0·54%) proved positive at a titre of 1:40 or over. The first two human cases were investigated in December, 1927, since when one hundred cases have come to light annually.

II. M. describes an investigation with the following objects:—to ascertain the prevalence of agglutinins to *Br. a.* in a series of human beings and in some of the classes of animals presumed to have been in contact with infected cattle; to assess the accuracy of the agglutination test as a diagnostic procedure; to ascertain the incidence of *Br.a.* in cows' and goats' milk, and to examine the species and virulence of organisms recovered.

Of sera from five hundred human beings with febrile conditions, 50 agglutinated *Br.a.* in dilutions of 1 : 25 to 1 : 5,000, while of sera from one thousand human beings with no history of recent pyrexia, ten agglutinated at dilutions of from 1 : 25 to 1 : 500. Of sera from 575 sheep, 21 gave positive reactions; 20 out of 920 pigs were positive and two out of 100 poultry, but 200 rats were examined and all were negative. Of 397 samples of cows' milk, 6·3% showed the presence of *Br.a.*, but of 57 samples of goats' milk none was found infected. Many infected samples of cows' milk failed to show the presence of agglutinins.

All organisms recovered were of the bovine type, and were of low virulence for g. pigs, which may explain the comparative rarity of cases of undulant fever in human beings.

III. A comparison is given of the incidence of Malta fever in the military population, who drink only boiled milk, and in the civil population, who often drink unboiled milk. The number of cases was negligible in the former and rose to hundreds in the latter. Percentage figures are not given.

The problem of the human carrier is discussed in view of the infectivity of urine of human beings even during apyretic periods. The abortin test in goats,

of which 15% are said to be affected, is briefly referred to. Compulsory pasteurization of milk is not yet contemplated in Malta.

IV. P. describes in detail an investigation conducted to ascertain to what extent goats which have aborted remain infective to clean goats. Infected and clean goats were kept in close contact for this purpose, and it was shown that infectivity persists for long periods. The slaughter of affected goats is recommended as the best means of suppressing an outbreak of goat brucellosis.—H. B.

Jeannotte, A. (1938). Enquête sur un cas de fièvre ondulante. [**Enquiry into a Case of Undulant Fever**].—*Canad. publ. Hlth J.* **29.** 86-87. [1 ref.] [In French].

J. reports a case of undulant fever in a small village. The dairy supplying the milk had seven cows showing agglutinins to *Brucella abortus*; its sanitary conditions were unfavourable. Although the herd was heavily infected, only one human case developed, which suggests that undulant fever is not as readily transmitted through milk as typhoid, diphtheria, etc.—L. B.

Walbum, L. E., & Reymann, G. C. (1938). **The Production of Toxin by** *Bacillus histolyticus* (*Cl. histolyticum*).—*J. Path. Bact.* **46.** 315-322. 2 figs., 9 tables. [13 refs.]

Good growths of *Cl. h.* were obtained in glucose peptone broth with meat covered with liquid paraffin. Using this method, the authors obtained data concerning the effect of the different components on toxin production, and noted results which differed from those reported by other workers. They observed that the highest toxin production occurred in glucose-free or *coli*-fermented broth containing 4% peptone and an abundance of meat. The addition of glucose decreased toxin production. The optimum reaction for the albumose-digesting enzyme differed from the reaction for maximum toxin production. A reaction in the neighbourhood of pH 6·0 was the most favourable for the stabilization of the toxin.—R. E. Glover.

Meisel, H. (1938). Ueber die Antigenstruktur der Gasbazillen. [**Antigenic Structure of Gas Gangrene Bacilli**].—*Z. ImmunForsch.* **92.** 79-86. 3 tables. [8 refs.]

Cross-agglutination reactions between ten strains of *Clostridium welchii* Type A and their respective sera gave two groups. One group of six strains cross-agglutinated, the other four were strain specific. Complement-fixation tests with polysaccharide obtained by acid extraction gave similar results. Alkali-extracted polysaccharide was not so effective.—P. S. Watts.

Vizy, L. (1937). Vizsgálatok a Vibrio foetus biologiai tulajdonságairól. [**The Biological Properties of** *V.f.*]—*Állatorv. Lapok.* **60.** 285-287. 1 fig.

A strain of *V.f.*, isolated from a bovine foetus, multiplied and retained its vibrio form on fresh blood agar and on ordinary agar, with or without peptone, at a pH of 5·8 or less, but on heated blood agar, or on ordinary agar, with peptone, at a pH above 6·2, it became coccoid and grew more rapidly. It then took stains more readily and was more motile than the vibrio form. The author regards the coccoid form as the product of relatively unfavourable living conditions. On improvement of the latter, the coccoid form was transformed into the vibrio form.
—G. Sályi (Budapest).

I. Koser, S. A., Finkle, R. D., Dorfman, A., & Saunders, F. (1938). **Studies on Bacterial Nutrition. The Possible Role of Inorganic Salts and of Alterations in the Culture Medium in Providing Growth-Promoting Effects.**—*J. infect. Dis.* **62.** 202-208. 1 table. [Numerous refs.]

II. Koser, S. A., Finkle, R. D., Dorfman, A., Gordon, Mary V., & Saunders, F. (1938). **Studies on Bacterial Nutrition. A Comparative Study of the Growth-Promoting Properties of Various Substances.**—*Ibid.* 209-218. 6 tables. [Numerous refs.]

I. The addition of small amounts of metallic salts, including those of iron, Cu, Mg, Co, Zn and I, to synthetic media, was shown to have no growth-promoting effect upon six different micro-organisms [names not given] such as that produced by tissue fractions of spleen, liver and yeast. No promotion of growth is afforded by alterations in the physical character of the test medium by adding reducing agents, powdered agar, asbestos shreds, etc.

II. The authors studied the growth-promoting activity of a number of preparations added in varying amounts to synthetic media, incapable alone of growing the six test micro-organisms. The factor for propionic acid bacteria of Tatum, Wood and Paterson, beta-alanine alone, and certain mixtures of them caused growth.—R. O. Muir.

Tunnicliff, E. A. (1938). **A Study of Actinomyces necrophorus in Soil Cultures.**—*J. infect. Dis.* **62.** 58-65. [9 refs.]

Two strains of *Fusiformis necrophorus*, isolated by rabbit injection from entirely separate outbreaks of foot-rot in sheep, were inoculated into soil media representative of typical foot-rot pastures and incubated at 35°-37°C. under anaerobic conditions. T. confirms field evidence that the organism normally survives in natural soil for only a short time, although a few organisms may exceptionally remain alive for an extended period. The organism cannot, therefore, be classed as a saprophyte.—R. O. Muir.

Lemoine, P. (1936). La botryomycose chez les animaux domestiques. Essai de reproduction expérimentale des lésions botryomycosiques à partir du staphylocoque. [**Botryomycosis in Domestic Animals. Attempts to Reproduce the Lesions of Botryomycosis by means of Staphylococci**].—*Thesis, Alfort.* pp. 43. 1 fig. [Numerous refs.]

Following a review of the bacteriology of botryomycosis and its occurrence in the domestic animals, two experiments are described in which L. attempted to reproduce botryomycotic lesions in rabbits by virulent human staphylococci. Twenty-four hour cultures of *Staph. pyogenes aureus* emulsified in pea-nut oil were injected subcutaneously. Although the typical granules of botryomycosis were not produced, the staphylococci became adapted to a retarded disease process, with the formation of an encapsulated caseous nodule.—R. O. Muir.

DISEASES CAUSED BY PROTOZOAN PARASITES.

Saleun, G. (1937). Service de la surveillance de la maladie du sommeil. [**Survey of Human Trypanosomiasis in Brazzaville during 1936**].—*Rep. Inst. Pasteur Brazzaville, 1936.* pp. 73-85.

In discussing the control of human trypanosomiasis S. emphasizes the importance of early treatment. Cases treated in the early stages are said to yield more readily to arsenical preparations, which are still the most satisfactory agents

available. Although advanced cases improve under treatment, they often relapse later, and in some such cases the trypanosomes become resistant to arsenicals. Apparently recovered individuals who return to tsetse areas may thus be carriers of an arsenic-resistant trypanosome strain. Moranyl is said to be useful in treating cases resistant to arsenic as long as trypanosomes are still present in the blood, but it is not satisfactory in the nervous stage of the disease.—U. F. Richardson.

Tartaglia, P. (1937). La leishmaniose canine à Split. [**Canine Leishmaniasis at Split (Yugoslavia)**].—*Bull. Off. int. Hyg. Publ.* **29.** 1927-1930. 1 map. [1 ref.]

Two out of 28 dogs were examined by the spleen puncture method, with positive results. No signs of leishmaniasis were evident in them.—J. E.

I. Quittek, G. (1936). Die Trichomoniasis (" Gelber Knopf ") der Tauben. [**Trichomoniasis (" Yellow Button ") in Pigeons**].—*Z. Brieftaubenk.* **51.** 938-939. 4 figs.

II. Schaaf, J. (1937). Ueber Nabelinfektionen beim Junggeflügel insbesondere im Zussamenhang mit dem " Gelben Knopf " bei Jungtauben. [**Umbilical Infection in Young Poultry in Connexion with " Yellow Button " in Young Pigeons**].—*Z. InfektKr. Haustiere.* **51.** 57-66. 4 figs. [17 refs.]

I. There are two forms of trichomoniasis in pigeons, the laryngeal and the hepatic, and to the first form the name " yellow button " is applied. Infection is carried by breeding pigeons which harbour the organism in the oesophagus without being ill themselves. The progeny of such birds become affected and cannot be cured. For the control of the disease in breeding pigeons it is recommended that a 0·5% solution of copper sulphate or " sulpholiquid " should be given as drinking water for two or three weeks.

II. S. observed navel infections in chicks whose egg yolk sac had not been infected with *Salmonella pullorum*. There was a slight thickening of the navel which was sometimes covered by a scab. The chicks showed general ill health and diarrhoea. At P.M. examination there was a subcutaneous oedema and slight peritonitis. Bacteria isolated did not appear to be the causal agents. The same condition occurred in pigeons, often simultaneously with so-called " yellow button " in which there is diphtheroid inflammation of the nasal cavities, oesophagus and crop. " Yellow button " occurs in pigeons subjected to cold, damp weather and bad hygienic conditions. Pigeon breeders say that it is inherited. Affected pigeons have a swollen navel which contains a dry friable mass which breaks out through the skin as a cauliflower-like tumour. Trichomonads are to be found in it, but it is doubtful whether they are the sole cause.

—Sassenhof (Munich).

Manwell, R. D. (1938). **Reciprocal Immunity in Avian Malarias.**—*Amer. J. Hyg.* **27.** 196-211. 1 table. [Numerous refs.]

When using the word " immunity " M. refers to a state for which the term " premunition " was proposed by Sergent, Parrot and Donatien [(1924). *Bull. Soc. Path. exot.* **17.** 37]. He reviews the literature on infection in birds, mammals and the invertebrate hosts. A list of the plasmodia studied is given and also their source.

Birds were inoculated either intravenously or intramuscularly, kept in screened cages for two months or more and inoculated with the second species of malarial organism. The method of measurement of infection and/or resistance to infection used by M. is based on the number of cells seen infected.

The results are summarized in a table. Reciprocal immunity experiments may be useful as an aid to the establishment of the identity of species.—L. E. H.

KLARENBEEK, A., & WINSSER, J. (1937). Ein Fall von spontaner Weilscher Krankheit bei Ferkeln. [**Leptospirosis in Piglets**].—*Dtsch. tierärztl. Wschr.* **45.** 434-435.

Four three-week-old piglets sickened with jaundice and one died. Leptospira could not be found in the dead pig; blood was taken from the ear of one which recovered after acute illness and was injected into g. pigs. Leptospira appeared in the peritoneal fluid of the latter within three days, but it was not possible to passage the infection to two four-week-old piglets.

The urine of the other two piglets which recovered showed leptospira between the 17th and 31st days of illness and their blood had a lytic effect on a strain of *Leptospira icterohaemorragiae*, but not on *L. canicola*.

It is suggested that this finding of leptospira in pigs may account for the relatively high incidence of Weil's disease in abattoir workers.—G. H. (VIENNA).

JUNGHERR, E. (1937). **Observations on Canine Spirochetosis in Connecticut.**—*J. Amer. vet. med. Ass.* **91.** 661-673. 10 figs. [Numerous refs.]

The important pathogenic members of the family spirochaetaceae belong to the genera *Leptospira* and *Treponema*. The pathology and clinical symptoms encountered in an outbreak of canine leptospirosis (*L. icterohaemorrhagiae*) are here described in detail and illustrated with numerous photomicrographs. A leptospira-like organism was isolated in primary cultures which were pathogenic to g. pigs, but the organism failed to grow when sub-cultured. A comparatively low virulence for g. pigs suggested *L. canicola*.

An outbreak of epizootic diarrhoea occurred in a greyhound kennel and four out of 15 young dogs succumbed. P.M. examination of a dog disclosed pneumonic involvement of most of the left lung, with purulent exudate in the bronchi. The digestive tract showed small haemorrhages in the gastric mucosa and petechiae, and oedemato-mucoid swelling in the colon. A beta-haemolytic streptococcus isolated from the affected lung was probably the actual cause of death, but smears from the intestinal lesions showed swarms of spirochaetes. Cultures of these organisms could only be obtained from the intestine and their morphology closely resembled that of *Tr. eurygyrata*.—S. J. GILBERT.

HAJDU, G. (1937). Vizsgálatok a patkánybartonellosis kórtana köréből. [**Bartonellosis of Rats**].—*Állatorv. Lapok.* **60.** 335-340. 5 figs. [1 ref.]

Bartonella infection broke out in a stock of rats subjected to splenectomy, the mortality being 20%. Twenty-eight rats from the same stock were put on a rachitogenic diet for 1-4 weeks and were then splenectomized, with the result that they contracted severe bartonellosis and 40% died. Bartonellosis did not occur in similar rats which were kept on a rachitogenic diet, but not splenectomized.—G. SÁLYI (BUDAPEST).

CIRENEI, G. (1937). La sarcosporidiosi bovina. [**Bovine Sarcosporidiosis**].—*Clin. vet., Milano.* **60.** 758-763. 6 figs. on 1 plate. [German summary].

Areas showing a greyish-yellow discoloration were observed in the intercostal and abdominal muscles of a 13-month-old bullock. The remainder of the muscles were normal, as also were the lymph nodes. The discoloured areas were difficult to cut due to an increase of connective tissue. Histological examination revealed that many of the muscle fibres had completely degenerated and numerous eosinophiles were present. The myositis was considered to be parasitic in origin, and

after the examination of numerous serial sections sarcosporidia were demonstrated. The striking features of the condition were the degeneration of so many muscle fibres, probably due to some toxic action on the part of the parasite, and the presence of an inflammatory reaction of the muscle cells in place of the more usual connective tissue reaction.—J. A. Nicholson.

DISEASES CAUSED BY VIRUSES.

—. (1938). Projet de convention présenté au Riksdag par sa majesté le roi en vue d'établir une collaboration entre la Suède et le Danemark, afin de combattre la fièvre aphteuse. [**An Agreement between Sweden and Denmark for the Control of Foot and Mouth Disease**]. pp. 6 + 4. [fcp] [Mimeographed] [In French].

By this agreement between Sweden and Denmark, lasting until 31st March, 1939, an arrangement has been made for mutual assistance in controlling F. & M. disease in either or both countries. The slaughter-compensation policy is the main line of defence, but ring serum inoculation may also be carried out in suitable circumstances.

The cost of compensation if it exceeds 800,000 Danish kroner (but not the other expenses), is to be borne by both countries jointly, the sum due being calculated on a net basis after the proceeds of salvage of slaughtered animals has been taken into account. When the compensation costs in one country exceed 800,000 Danish kroner, the other country will contribute 40% of the excess up to a total sum of 1,800,000 Danish kroner, and 50% of any excess of the latter figure. Each country has appointed a commissioner to supervise F. & M. disease control in co-operation with that of the other country.—J. E.

I. Seydler, B. (1937). Der Einfluss oligodynamisch wirksamer Flüssigkeiten auf das Virus der Maul- und Klauenseuche. [**Influence of Oligodynamic Fluids on the Virus of Foot and Mouth Disease**].—*Inaug. Diss., Berlin.* pp. 22. 8 tables. [Numerous refs.]

II. Jacobzek, W. (1937). Versuche zu Immunisierung von Meerschweinchen gegen Maul- und Klauenseuche mit Aluminiumdroxyd-Vaccine. [**Immunization of Guinea Pigs against F. & M. Disease by $Al(OH)_3$ Vaccine**].—*Inaug. Diss., Berlin.* pp. 17. Numerous tables. [Numerous refs.]

I. A series of phosphate buffer solutions containing pieces of silver, lead or copper were tested for their action on F. & M. disease virus. Little or no inhibitory action was demonstrated, although the liquids were lethal to *Bacterium coli*. Use of a metallic Seitz filter also gave no loss of titre as compared with a glass filter.

II. J. gives the preparation of $Al(OH)_3$ absorbed vaccines from infective lymph of cattle and g. pigs and from infective serum of the latter. Tested on g. pigs with an interval of 3-50 days between vaccination and test infection, the vaccines usually prevented generalization, but primary vesicles occurred. The best results were obtained from a centrifuged vaccine of g. pig lymph. Of 94 g. pigs used in a test, seven died of F. & M. disease following vaccination.

—P. S. Watts.

—. (1938). **British East African Territories. Conference on Rinderpest. Held at Nairobi, 8th February, 1938.** pp. 8 + 2 + 4 + 1. 3 appendixes. 1 map. Nairobi: Meteorological Service Press. [fcp].

The conference considered the geographical distribution of rinderpest in East Africa and discussed control measures; particular attention was paid to the

alarming southward spread of the disease, but also to its ultimate eradication from East Africa. The conference passed a resolution that it considers existing methods are adequate to arrest the southward spread of the disease and also to drive it north, providing sufficient funds are available. All ungulates are regarded as susceptible, but it was agreed that the disease only exists where there are cattle. It was proposed as a temporary measure that a 40-mile-wide belt in which the cattle would receive triple vaccine inoculations should be used as a barrier to prevent the disease from spreading southward. The situation is to be reviewed after a year. The conference recorded that it should be possible within a reasonable period of time to eradicate the disease. HORNBY's quotation of LECLAINCHE's remarks are pertinent, in effect they are :– " Rinderpest will never be driven from Africa until all the European nations concerned make a co-ordinated effort against the disease ". [The conference does not appear to have considered the position regarding rinderpest outside East Africa].—J. A. GRIFFITHS.

RAD-PEZECHK, A. (1935). L'état actuel de nos connaissances sur la peste bovine avec considérations particulières sur la peste bovine en Iran. [**Rinderpest in Iran**].—*Thesis, Alfort.* pp. 45. [Numerous refs.]

In addition to a description of the disease, notes are given on it in Iran; much of this part is quoted from other workers, chiefly HAMEDY [(1931). *Rév. gén. Méd. vét.* **40.** 397]. Rinderpest is enzootic in northern Iran and epizootics occur every few years, being associated with a mortality of 80-90%. No effective control has yet been instituted.—J. E.

FULTON, J. S. (1938). **A Report of Two Outbreaks of Equine Encephalomyelitis in Saskatchewan.**—*Canad. J. comp. Med.* **2.** 39-46. [9 refs.]

F. describes two epidemics of the disease that occurred in Saskatchewan in 1936 and 1937. In both instances, the outbreaks appeared in the late summer and autumn, and in practically the same territory. The virus, which passes through a Berkefeld N filter, was found in the brain of field cases destroyed early in the course of the disease, but not in the peripheral circulation. Experimental transmission was accomplished by inoculating g. pigs intracerebrally with saline brain emulsions. F. believes that the disease has been present for many years, but that it has been described as " forage-poisoning ", " cerebro-spinal meningitis ", " blind staggers ", or " sleeping sickness ".—L. B.

LAURELL, B. (1938). Diskussionsinlägg om infectiös anemi hos häst. [**Equine Infectious Anaemia**].—*Svensk VetTidskr.* **43.** 29-38. [4 refs.]

E.I.A. is still one of the greatest plagues to animal husbandry in Sweden, and the uncertainty as to its aetiology has always made it the subject of discussion, especially as to whether it shall be regarded as contagious or not. It is generally accepted, however, that the old comprehensive term " equine infectious anaemia " should be sub-divided to include one genuine contagious form and one or several non-contagious blood diseases.

The fact that the general disease (all types referred to above) is strongly localized to well defined districts, seems also well established. Practical experience has taught L. that these localities are all characterized by extensive communal forest pastures on which horses from the whole districts are turned out to graze. He discusses the possibility of inducing farmers to give up this practice. If this theory holds good, adoption of the measure suggested might provide a practical step towards the control of the disease, and an aid to the elucidation of its aetiology.

—GUSTAV NAERLAND (OSLO).

Panisset, M. (1938). **The Blood Sedimentation Test in the Diagnosis of Equine Infectious Anaemia.**—*Canad. J. comp. Med.* **2.** 3-12. 3 figs., 1 table. [18 refs.]

P. describes the principles, apparatus and procedure followed in the blood sedimentation test used at the Quebec Veterinary School in the diagnosis of E.I.A. The method, which utilizes the blood sedimentation indices proposed by Cesari (1913), though not the most accurate, is considered to be the most practicable. Absolute specificity is not claimed for the test ; however, P. claims that an accelerated sedimentation rate is a useful method of confirming tentative diagnoses of E.I.A. based on clinical and epidemiological findings.—Chas. A. Mitchell.

Kii, N., & Ando, K. (1937). **The Connexion between Equine Pustular Stomatitis and Vaccinia.**—*J. Jap. Soc. vet. Sci.* **16.** pp. 407-426 of pt. 1. 6 tables. [7 refs.] [In Japanese : French summary pp. 53-54 of pt. 2].

This is the result of an investigation following an outbreak of equine contagious pustular stomatitis in Tokyo during 1936. The authors confirm the work of early workers, notably de Jong (1916), van Heelsbergen (1920), Tróth (1921) and Zwick (1924). Their findings are the result of experiments with rabbits, which showed that equine contagious pustular stomatitis and vaccinia in the horse are identical. The serum of horses recovered from the former condition is also said to have neutralized horse pox virus.—J. A. Griffiths.

Michalka, J. (1937). Ausbreitung und Bekämpfung der Schweinepest in Oesterreich in den Jahren 1933 bis 1936. [**Swine Fever in Austria, 1933-1936**].—*Wien. tierärztl. Mschr.* **24.** 449-453. 2 tables.

A statistical report of S.F. in Austria. In 1932 it occurred on two thousand newly infected farms. The corresponding number for 1933 was 1,472 ; for 1934, 1,204 ; for 1935, 885, and for 1936, 758. This reduction is ascribed to the increased use of active immunization, although during the same period the swine population decreased.

In the year 1935-1936, 12,705 pigs in 158 farms and 7,658 pigs in 28 pig fattening establishments were immunized by serum and virus, with a vaccination loss of 0·5 %. Simultaneous inoculation was also carried out with slight loss, on young pigs in breeding herds previously immunized, and was applied to 2,046 pigs in badly infected farms with a loss of 15·7 %.—G. Hartmann (Vienna).

Michalka, J. (1937). Der heutige Stand der Diagnostik und Immunotherapie der Schweinepest. [**The Present Position of Swine Fever Diagnosis and Immunity**].—*Ergebn. Hyg. Bakt.* **19.** 127-177. 1 table. [Numerous refs.]

Diagnosis.—After an introduction enumerating the causes of difficulty in diagnosing this disease, M. discusses each method. The transmission test on healthy pigs, using a filtrate of blood, urine or organ extract (spleen, lymph node or bone-marrow) is most reliable, and should be carried out on two test animals which are then to be observed for three weeks. If they sicken in 3-5 days and die of acute illness, and show the lesions of acute S.F., the diagnosis is positive. It is also positive if they sicken slightly, and recover and within a week withstand a dose of virus which kills a third test pig (control), thus indicating that they had been immunized by the first injection. It is important to remember in this work that immunity against S.F. is relative, and not complete or solid : it can often be broken down by a virus injection of suitable dosage.

Diagnosis by isolation and cultivation of the virus in tissue culture has been carried out, but is not a practicable measure as the virus must be identified by pig inoculation. Diagnosis on epidemiological grounds is extremely difficult and exact guiding rules cannot be laid down.

The course of S.F. is influenced by various factors of which the most important are variation in potency of the virus and variation in the degree of resistance of the pigs. Recent swine erysipelas immunization may affect the latter, so may the nutritional condition, with special reference to vitamin C-deficiency. The clinical symptoms of acute, subacute and chronic S.F. are described : they are of secondary value in diagnosis, but are of significance when considered along with P.M. findings. Acute S.F. is characteristically a haemorrhagic diathesis in which petechiae occur in and on almost all tissues—internal organs, serous membranes and lymph nodes. The spleen shows haemorrhagic or anaemic infarcts, and the kidneys, as well as containing petechiae, have a gelatinous appearance. The above conditions are important. In subacute S.F. the haemorrhages are less evident and lesions in the lungs and intestine predominate (croupous pneumonia and gastro-enteritis). Of the intestinal lesions only the button ulcers indicate S.F. ; other types of enteritis are insignificant diagnostically. It is useful to know how long the pig has been infected in considering the significance of lesions found. M. enumerates the P.M. changes in pigs which have had S.F. for one, two and three weeks respectively.

Histologically acute S.F. is characterized by degeneration of the blood vessel endothelium and a hyaline or necrotic condition of the capillaries of all the tissues named above. The brain also shows the same vascular lesions in 70-90 % of cases. In subacute cases the inflammatory process is seen to have progressed to haemorrhagic-necrotic inflammation and in chronic cases there is evidence of repair (perivascular infiltration with lymphoid cells). M. concludes that histological diagnosis is not very valuable as the changes seen are not strictly specific to S.F. No reliable method of diagnosis by cell inclusions has been elaborated, though some workers have claimed to have found some in the conjunctiva in the early stages. Bacteriological diagnosis is of no value in S.F. The commonest secondary invaders are *Salmonella cholerae-suis* and *Pasteurella suiseptica*.

The following immuno-biological methods have been found useless for the diagnosis of S.F. :– complement-fixation, precipitation, Abderhalden's dialysis test, Meinicke's lipoid-fixation test, the Weil-Felix reaction, demonstration of virus-neutralizing antibodies, and the formol-gel reaction. The precipitin method of Zuwerkalow and Kutscherenko is described, and M. concludes provisionally that it is really a test for albuminuria alone and, therefore, useless for S.F. Sarnowiec's allergic test is also considered valueless.

Immunization.—Antiserum is expensive to produce, as animals of the large species cannot be employed. M. describes the procedure for hyperimmunizing pigs for serum production. There are rapid and slow methods. Methods for titrating antiserum in America, Germany, Hungary and Yugoslavia are described : they are all based on simultaneous inoculation of a series of pigs with a unit dose of virus and graded doses of antiserum. Convalescent serum has been tried and condemned for protective or curative uses. The literature on the value of passive immunization with antiserum is reviewed, and it is concluded that this method is not sufficiently reliable for general adoption. Attempts were made to turn a passive immunity into an active one by feeding the tissues of pigs dead of S.F. to pigs which had been given antiserum a few days previously. However, losses exceeded those following serum-virus inoculation, of which there are five methods : (1) serum (normal dose) followed by serum (normal dose) + stock virus ; (2) serum + herd-specific virus ; (3) serum + stock virus using a small dose of

serum ; (4) serum + stock virus using a large dose of serum, and (5) serum (normal dose) + stock virus followed by stock virus. Losses with method (4) are less than those with method (3), and virus carriers cause less trouble. Given a potent virus, immunity from simultaneous inoculation is practically life-long. M. gives the results of his work [see previous abstract] and discusses the virus carrier problem. Virus may be excreted over a long period (the longest mentioned being 92 days) in the urine of pigs subjected to serum-virus inoculation ; for this reason it is advisable when immunization is undertaken to deal with every pig on the premises, from the age of two weeks upwards.

Piglets destined for pork or bacon need only be immunized once, but if they are used for breeding it is advisable to re-immunize them again eight weeks before their first service. Piglets of immune sows are immune during the suckling period only.

Formalin treated blood filtrates or organ extract filtrates were used with some success, but it appears that the immunity thus conferred is not so strong or lasting as that following serum + virus injection. M. concludes with advice on the type of immunization method to use in various circumstances.—J. E.

Geiger, W. (1937). Virusschweinepest beim Wildschwein. [**Swine Fever in Wild Pigs**].—*Dtsch. tierärztl. Wschr.* **45.** 606-609.

G. investigated an outbreak of fatal disease among wild pigs in a large park. The disease somewhat resembled swine fever, but it could not be transmitted to domestic pigs. Three pigs—an adult and two young ones—of the wild herd were obtained and infected with S.F. virus [no details given]. The two young ones became mildly affected after a long incubation period—up to six days. The adult animal was more resistant, and did not become very ill, but its blood was found to be virulent on the 11th day after infection. Three further wild piglets were fatally affected with S.F.—G. Hartmann (Vienna).

Debelić, Š. (1938). Patološko-anatomske promjene i strani miris u mesu virus-svinja. [**Lesions and Odour of the Flesh of Pigs with Swine Fever**].—*Vet. Arhiv.* **8.** 1-12. [10 refs.] [German summary].

The lesions found in pigs used for the production of S.F. virus are described. The lymph nodes seem to be always affected; the kidneys, spleen, skin and musculature frequently contain lesions ; the spleen and heart are sometimes affected, but the lungs are healthy. The flesh from such pigs has a characteristic odour. The intensity of both the lesions and the odour seems to be proportional to the intensity of the infection.—B. Oswald (Križevci).

Szilágyi, K. (1937). A sertéspestis elleni szimultán oltással kapcsolatban tett megfigyeléseim. [**Serum-Virus Inoculation against Swine Fever**].—*Állatorv. Lapok.* **60.** 323-324.

S. observed that the immunity against S.F. conferred by serum-virus simultaneous inoculation could be increased considerably by a virus injection three weeks later. Pigs so treated resisted infection with 1-2 c.c. of virus carried out one year later, but four pregnant sows which had been immunized and reinfected in this way aborted, although they did not develop swine fever, and some others which farrowed at full term produced litters in which 80 % were dead. S. obtained good results by adding swine erysipelas antiserum to S.F. antiserum when immunizing pigs against S.F. by serum-virus in districts where both diseases were prevalent.—G. Sályi (Budapest).

Carlström, B., & Svensson, J. (1938). Om valpsjuka hos räv. **[Distemper in Foxes].**—*Skand. VetTidskr.* **28.** 177-185. Discussion pp. 186-188. [2 refs.] [English summary].

The authors discuss earlier reports on distemper or distemper-like diseases in the fox. Fox distemper, as it occurs in Norway is due to a virus found in the blood (but not in the spleen or brain) during the initial fever phase of the disease, and transmissible to foxes, but not to dogs. Dog distemper immune serum (Laidlaw-Dunkin) did not protect against the infection, whereas "Staupe-Immuneserum" Behring proved a valuable prophylactic.

C. and S. report an outbreak on a fox farm in Sweden of a disease in fox cubs bearing much similarity to distemper in dogs. By means of Berkefeld-filtered materials the disease was found to be transmissible to healthy foxes, five experimental animals being used. Laidlaw-Dunkin immune serum protected against experimental infection and checked any further spread of the disease on the farm, but it was of little or no value as a cure. Comparisons are made between this virus infection observed in Sweden and the Norwegian type.

In the discussion which followed, Wall stated that a specific salmonella infection occurs in the fox and cannot always be looked upon as a secondary affection. This is important in connexion with diagnosis.—G. Naerland (Oslo).

I. Kidd, J. G. (1938). **The Course of Virus-Induced Rabbit Papillomas as Determined by Virus, Cells, and Host.**—*J. exp. Med.* **67.** 551-574. 7 figs. on 2 plates, 6 charts. [14 refs.]

II. Beard, J. W., & Wyckoff, R. W. G. (1938). **The pH Stability of the Papilloma Virus Protein.**—*J. biol. Chem.* **123.** 461-470. 7 figs. on 1 plate, 1 table, 3 charts. [10 refs.]

I. An experimental analysis of factors responsible for observed differences in virus-produced papillomata of rabbits. Some appear to be due to the virus. Retrogression of these papillomata appears to be due to generalized resistance of host origin, elicited by and directed against the proliferating virus-infected cells. For details the original should be consulted.

II. A study of the pH range of stability of the molecules and the infectivity of solutions of purified heavy protein isolated from virus-produced warts on cottontail rabbits. Immediate inactivation of virus occurs at those pH values at which protein molecules break down. There is a gradual loss of viral activity in weak alkaline solutions which is not reflected in observable changes in molecular sedimentation rates. Observations are said to be compatible with the hypothesis that the homogeneous heavy protein is the causative agent of infectious papillomatosis in rabbits.—J. A. Griffiths.

Buddingh, J. G. (1938). **A Meningo-Encephalitis in Chicks Produced by the Intracerebral Injection of Fowl Pox Virus.**—*J. exp. Med.* **67.** 921-931. 12 figs. on 2 plates, 1 table. [11 refs.]

Experiments show that the intracerebral injection of fowl pox virus causes a meningo-encephalitis within four or five days, followed by spastic paralysis and convulsions on the sixth or seventh day and death on the seventh or eighth day. Fowl pox inclusions can be demonstrated within the infected cells. The virus has been carried through 14 successive intracerebral passages, and there is no difference in the symptoms and lesions in chicks inoculated with the 14th passage from those in chicks inoculated with the first. No enhancement of virulence appears to be brought about in the virus by the intracerebral environment after repeated passage.

—J. A. Griffiths.

PARASITES IN RELATION TO DISEASE [GENERAL]

ANON. (1937). **The Committee on the Practice of Parasitology.**—*Canad. J. comp. Med.* **1.** No. 3. 30.

Attempts to form such a committee have so far been only partially successful. There seems to be interest in the scheme, but willingness to co-operate, which can be shown only by the return of a questionnaire sent out previously, is lacking. Valuable data are on hand for administration of anthelmintics, and these will be forwarded to each approved co-operator.—L. B.

EHRLICH, I. (1938). Paraziticka fauna mačaka iz Zagreba i zagrebačke okolice. [**Parasites of Cats in the Neighbourhood of Zagreb**].—*Vet. Arhiv.* **8.** 13-34. 2 figs., 2 tables. [Numerous refs.] [German summary].

One hundred cats were examined for parasites, and the following species were found:—*Echinochasmus perfoliatus*, once in the small intestine; *Dipylidium caninum*, 28 times in the small intestine; *Taenia taeniaeformis*, 43 times in the small intestine; *Toxocara cati*, 59 times in the duodenum; *Ancylostoma caninum*, 52 times in the jejumum; *Capillaria plica*, 35 times in the urinary bladder; *C.* (*Thominx*) *felis-cati*, once in the urinary bladder; *Capillaria sp.* six times in the urinary bladder; *Notoedres cati*, once on the skin; *Ixodes ricinus*, once on the ear; *Felicola subrostrata*, 40 times on the hair; *Ctenocephalides felis*, 87 times on the hair, and *Linguatula serrata*, larvae, twice.

The description of a species of *Capillaria* from the urinary bladder is given; it is considered to be a new species.

A worm named *Capillaria felis cati* has been found in Russia by ZAHAROV (1920) and in Brazil by FREITUS and LENT (1935) and E. considers that they are distinct species. He uses the sub-generic name *Thominx* for the Russian worm and *Capillaria* for the Brazilian worm.—B. OSWALD (KRIŽEVCI).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

HEARLE, E. (1938). **The Ticks of British Columbia.**—*Sci. Agric.* **18.** 341-354. [Numerous refs.]

H. summarizes the data on the ticks occurring in British Columbia, no attempt being made to give detailed descriptions. Following a brief survey of the literature, a concise list is given of the Ixodoidea believed or known to occur in the province. The hosts and the tick species taken from them are also listed, together with brief notes on the various tick species found.—L. B.

MOILLIET, T. K. (1937). **A Review of Tick Paralysis in Cattle in British Columbia, with Notes on Several New Cases.**—*Proc. Soc. Ent., B. C.* No. 33. pp. 35-39. [6 refs.]

M., in opening, briefly reviews the history of tick paralysis in British Columbia, showing its sporadic nature. He then describes a serious outbreak in 1934 in a herd of 638 cattle; 200 of them were infected badly enough to be unable to stand and 26 died. The methods used to deal with the outbreak are given and attention is drawn to two other outbreaks in different parts of the province in the same year, although in one it is not known if ticks were the only factor responsible. A table is presented showing the variable and constant factors between this and the first serious outbreak in the province which occurred in 1930 involving a herd of 600 head with a mortality of 7%. From the data available M. stresses the

following points :– (1) the variability in the power of the tick to paralyse ; (2) the increase in *Dermacentor andersoni* Stiles, the only tick involved in the British Colombia outbreaks and the reason for this increase ; (3) a peculiar feature of the disease, *viz*, inability of the animals to straighten their front legs, and (4) the likelihood of cattle acquiring immunity.—L. B.

Jellison, W. L., & Kohls, G. M. (1938). **Tick-Host Anemia : A Secondary Anemia Induced by** *Dermacentor andersoni* **Stiles.**—*J. Parasit.* **24.** 143-154. 6 tables. [7 refs.]

The rearing of strains of *D.a.* free from the virus of Rocky Mountain spotted fever is carried out as part of the routine work at the Rocky Mountain Laboratory at Hamilton, Montana, rabbits being used and each rabbit being infested with 80-120 adult ticks. Deaths in rabbits gave rise to this investigation to find whether loss of blood was alone responsible.

Individual rabbits in a series were infested with increasing numbers of ticks which were allowed to engorge ; it was found that severe anaemia occurred and that death followed when a rabbit was infested with a minimum of 60 male and 60 female ticks. In another test 1-5 males and 1-5 female ticks were placed on each of five rabbits on the first day, and additional equal numbers on each succeeding day for a maximum of 22 days, ticks being removed after engorgement. It was found that this type of serial tick feeding was less harmful to the rabbit than one mass infestation. Another group of nine rabbits were all infested with 75 males and 75 females and R.B.C. counts were made on the third, seventh and tenth days, one third of the rabbits being freed from ticks each time. Only one rabbit died, but by the seventh day all those still infested showed extreme anaemia, and all the survivors quickly recovered from anaemia after de-infestation.

It is concluded that loss of blood was the chief cause of death in heavily infested animals, but that there is a possibility that another factor (a substance injected by ticks) might be involved.—J. E.

Gregson, J. D. (1937). **Studies on the Rate of Tick Feeding in Relation to Disease.**—*Proc. Soc. Ent., B. C.* No. 33. pp. 15-21. 2 figs.

This paper attempts to throw some light on the complicated problem of tick paralysis. It is thought to be due to the rapid injection of a tick salivary toxin which would logically accompany a tick's rapid feeding. G. studied the individual variation in the rate of feeding of ticks from the same stock. Twenty-eight pairs of adult ticks were placed on different parts of a lamb's body ; as soon as two of the ticks were engorged, the animal was killed and sections were made of the host tissue under fast and slow feeding ticks. G. concludes that slow feeding ticks merely lack the power to produce sufficient tissue disturbance to cause liberation of blood from the vessels, and not that they fail to tap a blood vessel. He considers, therefore, that any poisonous principle derived from the tick is likely to be absorbed from the tissues, and that it may not be necessary for it to be introduced into the blood vessel.—L. B.

Roberts, F. H. S. (1936). **A Note on Argas (Ornithodoros) Gurneyi Warburton.** —*Aust. vet. J.* **12.** 239-240. [4 refs.]

This tick normally attacks kangaroos and wallabies in northern Australia. It has been found to attack human beings and dogs. On man, ticks become fully engorged in 5-10 minutes and in some individuals the bite may cause a hard swelling with intense itching which may last 3 days. In one human case an attack resulted in temporary blindness and loss of consciousness. —H. McL. Gordon.

Roberts, F. H. S. (1936). **Gross Infestation of the Dog with the Kangaroo Louse Heterodoxus Longitarsus (Piaget).**—*Aust. vet. J.* **12.** 240. [1 ref.]

The kangaroo louse presents an example of a louse adapting itself to a host entirely unrelated to the original one. An instance is recorded of dogs, a fortnight old, being killed by heavy infestations with this louse.—H. McL. Gordon.

Szűcs, G., & Balás, G. (1937). Ujabb eljárás lovak tetvességének gyógykezelésére. [**The Delousing of Horses**].—*Állatorv. Lapok.* **60.** 321-323. [8 refs.]

The following mixture was used with success to free 133 army horses from lice :– 2·5 g. (96%) nicotine, 100 g. acetic acid (8-12%) and one litre of water. One careful application was found to be effective in destroying all the lice and eggs, though a repeated treatment might be necessary in some cases.—G. S. (Budapest).

Lewis, E. A. (1938). **Sheep Scab in Kenya Colony.**—*E. Afr. agric. J.* **3.** 298-306. 7 figs., 1 table. [8 refs.]

The sheep-raising industry in Kenya is slowly increasing in importance, but the presence of sheep scab in the flocks hinders the development of the industry. The sheep are sheared twice in the year, at six-monthly intervals.

Studies in the development of the sheep scab mite were conducted during October to December, 1930 and again from May to June, 1931.

Some difficulty was experienced in setting up an experimental infestation. One female began oviposition within 24 hours of being placed on a sheep.

The life-cycle of the sheep scab mite in both woolled and hairy sheep is described. The cycle appeared to be the same on both types of sheep and there was no observed difference in its length.

No differences were noted in the two time periods during which the observations were made. L. discusses the influence of local and general climatic conditions upon the development of the disease, and feels that further investigation into this problem is desirable.

Observations upon the value of lime-sulphur and arsenical compounds as dips were made and it was shown that both arsenic and lime-sulphur kill the sheep scab mite. Losses directly attributable to dipping were in the region of 0·4% and the hairy native sheep suffered more than the woolled sheep. The animals were dipped three times with an interval between dipping of 9-12 days.—L. E. Hughes.

Gray, D. F. (1937). **Sarcoptic Mange Affecting Wild Fauna in New South Wales.**—*Aust. vet. J.* **13.** 154-155.

Sarcoptes scabei is recorded from the fox and wombat. Some cases showed extensive lesions and there have been reports of animals succumbing from such infestation. There are also reports that dogs used for hunting wombats have become infested.—H. McL. Gordon.

Nieschulz, O. (1934). Ueber die Vorzugstemperatur von Stomoxys calcitrans. [**The Optimal Temperature for** *Stomoxys calcitrans*].—*Z. angew. Ent.* **21.** 224-238. 2 figs. [7 refs.]

An account of 188 separate tests of the effect of varied temperatures and humidity on *S.c.*, for details of which the original must be seen. In general it was found that the average optimal temperature is 27·9°C. for both sexes.—J. E.

Gibson, A., & Twinn, C. R. (1936). **Warble Fly Control in Canada.**—*Sci. Agric.* **17.** 178-198. 11 tables. [2 refs.] [French summary].

The authors, in this article, deal with the economic importance of the warble

fly, its life-history, and the results obtained in its control. Organized eradication campaigns conducted by federal, provincial and municipal authorities in Ontario, Quebec and British Columbia against *Hypoderma lineatum* and *H. bovis* demonstrated that properly applied and regular washings with derris powder and soap are useful in destroying these two species of warbles on the backs of infected cattle.—L. B.

Dove, W. E., & Bishopp, F. C. (1936). **The Screw Worm Situation in 1935.**—*J. econ. Ent.* **29.** 1076-1085. 1 fig., 1 table. [4 refs.]

This consists largely of statistical information collected by means of a questionnaire in the U.S.A., and gives figures for the southern states of the Union, throughout which *Cochliomyia americana* occurs. All kinds of farm livestock are attacked. Predisposing causes of screw worm attack are tick bites, surgical operations, navel infestation of newborn animals, horn and wire injuries, and bites by dogs. These can be largely prevented by better management; pine tar oil has an important place as a fly repellent.—J. E.

Boi, F. (1937). Osservazioni sulla infestione da Linguatula rhinaria negli animali della Sardegna. [**Infestation of Animals in Sardinia by** *L.r.*]—*Profilassi.* **10.** 81-88. [Numerous refs.]

Observations over a number of years showed that *L.r.* infestation is common in Sardinia, up to 80% of the adult cattle and sheep being affected. Young animals are seldom affected. The predilection seat for the encapsulated larvae is the mesenteric lymph nodes, but they may be found in almost any tissue, *e.g.* lungs, kidneys, intestines, peritoneum, etc.

An affected lymph node is normal in size and consistency, but shows small surface nodules the size of a pin-head. These have a characteristic greyish capsule and may contain actively moving larvae. The capsule is made up of modified epithelial cells and a few fibroblasts. After the larvae have migrated, the interior of the nodules becomes filled with numerous granulocytes, plasma cells and amorphous material which later becomes calcified.—J. A. Nicholson.

PARASITES IN RELATION TO DISEASE [HELMINTHS]

I. Bhalerao, G. D. (1936). **Studies on the Helminths of India. Trematoda I, II and III.**—*J. Helminth.* **14.** 163-180, 181-206 and 207-228. 17 figs., 2 tables. [Numerous refs.]

I. A detailed systematic description of trematodes collected from the pancreatic duct of cows in three separate districts in India. They were identified as *Eurytrema pancreaticum*, though the various lots differed in minor detail.

II. Deals with the worms of amphibia, etc.

III. Contains, *inter alia*, a description of *Opisthorchis noverca*, which was obtained from a dog in the Punjab, of *Echinochasmus perfoliatus* from cats in Calcutta, and of *Schistosoma spindalis* from a calf in Coorg.—J. E.

Ganslmayer, R. (1938). Laboratorijska istraživanja djelovanja kemijskih sredstava na Galba truncatula. [**The Action of Chemicals on the Liver Fluke Snail**].—*Vet. Arhiv.* **8.** 64-88. [Numerous refs.] [German summary].

Owing to the great damage caused by the liver fluke in Yugoslavia, methods for the eradication of its chief vector, *viz*, the snail *G.t.*, were examined. The action of several chemicals such as acetic acid, KOH and NaOH in 1% solution,

of lime water, and of copper sulphate in various dilutions, were tested. The best results were obtained with the last named. It is used as a spray in a 1% solution; in marshy places; its concentration after application must not be below 1 : 20,000 and the snails are killed within an hour.—B. Oswald (Križevci).

Heidegger, E. (1937). Libellula brunnea Fonsc. und Platycnemis pennipes Pall., zwei neue Hilfswirte der Eileiteregel der Hühner. [*L.b.* **and** *Pl.p.*, **Two New Intermediate Hosts of the Oviduct Flukes of Hens** (*Prosthogonimus sp.*)]. —*Arch. wiss. prakt. Tierheilk.* **72.** 224-229. 4 figs. [9 refs.]

H. reports the finding of cercariae of *Prosthogonimus* in *L.b.* and in *Pl.p.*, the former being most severely infected. Transmission experiments were carried out on non-laying hens and it was found that the infective larvae made their way into the cloaca direct from the ground, thence reaching the oviduct. Laying hens are more liable to infestation.—Sassenhoff (Munich).

van der Berghe, L. (1937). *Schistosoma bovis* chez deux antilopes, *Limnotragus spekei* (parc national de la Kagera, Ruanda sous mandat belge). [*S.b.* **in Two Antelopes in the Belgian Congo**].—*Ann. Parasit. hum. comp.* **15.** 518-519. [3 refs.]

S.b. was recovered from two water kudu or sitatunga. This is claimed to be the first recorded finding of this parasite in a wild mammal. Specimens were found in the hepatic and mesenteric veins. The eggs, however, were slightly smaller than those of parasites infesting bovines.—H. S. Purchase.

Penfold, W. J., Penfold, H. B., & Phillips, Mary. (1937). **The Criteria of Life and Viability of Mature Taenia Saginata Ova.**—*Med. J. Aust.* July 3rd. 1-5. 3 tables. [6 refs.]

It has been found that of *T.s.* ova stored in physiological saline at 2°-5°C., some were viable after 13½ weeks, but none after 16½ weeks. Some ova remained viable on dry pastures under sunny conditions for at least 14½ weeks. Some ova were viable after storage in physiological saline at 2°-5°C. for nine weeks and then after being exposed on pastures to mild conditions for eight weeks. Some ova kept dry for two days were viable. No ova dried and kept dry for one day in the presence of a small amount of common salt were viable. The maximum length of life of *T. saginata* ova on pasture under average conditions in Victoria has not been determined, but is thought to be probably only a few months.

The test of viability was the capacity of ova to produce *Cysticercus bovis* in cattle. It was found that other criteria of viability such as movements of flame cells, movements of onchospheres on warming or movement of artificially hatched embryos were unsatisfactory.—H. McL. Gordon.

I. Claussen, L. (1937). Ueber einen Futterungsversuch mit Muskelfinnen vom Reh. [**Artificial Infestation of Dogs with Muscle Cysticerci from Roe Deer**].—*Dtsch. tierärztl. Wschr.* **45.** 769-771. 4 figs. [8 refs.]

II. Keller, H. (1937). Ueber den Einfluss von Gefriertemperaturen von –1 bis –4 C auf die Lebensfähigkeit und Invasionsfähigkeit der Rinderfinne. [**Influence of Temperatures of –1 to –4°C. on Bovine Cysticerci**].—*Z. Fleisch- u. Milchhyg.* **47.** 393-397. [Numerous refs.]

I. Cysticerci were obtained from the muscles of roe deer and fed experimentally to two dogs, in one of which 16 tapeworms later developed. They were identified as *Taenia cervi*, and figures are given showing their form.

II. K. carried out numerous tests at the abattoir at Giessen on the viability of cysticerci from cattle after exposure to low temperatures. Viability was determined by placing the organisms in a solution of bile at body temperature in order to observe whether they would evaginate their heads, and their infectivity was tested on human beings by enclosing them in small celluloid vials, closed by a linen cap. These were swallowed and eventually passed out with the parasites still inside them. Infectivity was then judged by the size of the parasites. In positive cases they had developed into tapeworms of about 7 mm. long. Non-infective cysticerci had been digested and destroyed.

In the freezing tests pieces of infected meat were wrapped in layers of normal meat and the whole subjected to low temperatures, a thermometer being placed in the middle of each sample. Results showed that cysticerci are killed in meat after the following intervals and temperatures registered at the actual site of the cyst –1° to –1·5°C. for 14 days, –2°C. for five days, or –3° to –4°C. for one hour. —F. Freudenberg (Hamburg).

Pinto, C., & Lins de Almeida, J. (1937). Echinococcose ou hydatidose humana e animal especialmente no Brasil. [**Echinococcosis in Brazil**].—*Campo, Rio de J.* **8.** No. 86. 41-48 and 66; No. 87. 19-22; No. 88. 49-54; No. 90. 50-54 and No. 93. 65-69. Numerous figs., 1 graph. [English summary].

The authors give an excellent review of the question. Statistics are given for Australia, Argentina, Uruguay and, in great detail, for Brazil. It seems that human and animal hydatidosis is more prevalent in southern Brazil than elsewhere in that country. The original article should be consulted.—A. H. Hunter.

Heydon, G. A. M. (1936). **Oxyuriasis : A Possible Main Source of Infestation.** [**Correspondence**].—*Med. J. Aust.* Dec. 26th. 899.

Attention is drawn to a popular misconception that man may acquire oxyuriasis from rabbits infested with *Passalurus ambiguus*. Observations on rabbits heavily infested with this parasite seem to indicate the possibility of auto-infection from eggs developing without leaving the intestine of the host.—H. McL. Gordon.

I. Schmid, F., & Johannsen, H. (1937). Versuche zur Klärung des Wanderungsweges von Pferde-Strongylidenlarven im Tierkörper. [**The Movements of Horse Strongyle Larvae in the Body of the Host**].—*Dtsch. tierärztl. Wschr.* **45.** 749-751. 5 figs.

II. Bruns, W. (1937). Das Verhalten der invasionsfähigen Larven der Pferdestrongyliden in verschiedenen Bodenarten. [**The Behaviour of Infective Horse Strongyle Larvae in Various Kinds of Soil**].—*Inaug. Diss., Berlin.* pp. 32. [Numerous refs.]

I. G. pigs and white mice were infected with the larvae of *Strongylus equinus* and killed at various intervals in order to find the position of the parasites. It was found that the penetration of the intestinal wall by the larvae was most intense in the caecum. The larvae were found free in the abdominal cavity and in the pancreas and liver, but most found in these positions were dead. Other organs examined were free from these parasites.

II. Equal numbers of strongyle larvae were placed in different samples of soil and subjected to different degrees of moisture and illumination whilst being kept at a temperature of about 24°C. The movements were then studied. It was found that the larvae left the surface and made their way into the deeper layers

of soil in the presence of sunlight and returned to the surface in twilight and darkness. Of the samples of soil employed, fine sand proved to be most favourable for the larvae and the optimum moisture was 30%. Strongyle larvae were found to be able to move 1·5 cm. in one hour in fine sand.—F. Freudenberg (Hamburg).

Lucker, J. T. (1938). **Description and Differentiation of Infective Larvae of Three Species of Horse Strongyles.**—*Proc. helminth. Soc. Wash.* **5.** 1-5. 2 figs., 1 table.

Cultures of *Cylicocercus pateratus*, *Cylicocyclus insigne* and *Cylicodontophorus bicoronatus* were obtained from eggs removed from the uteri of identified females. The medium used and the conditions of growth are indicated and the morphological characteristics common to the three species described.

The larvae of the first two species appear to be indistinguishable. Those of *C.b.* differed from the other two species in the arrangement of the cells of the intestine. In median lateral optical section of the larvae of *C.b.* the intestinal cells formed two rows of four cells each, one row being dorsal and the other ventral to the sinuous lumen. In the larvae of *Cylicocercus pateratus* and *Cylicocyclus insigne* the five posterior intestinal cells were invariably arranged in tandem fashion. As pointed out by L., the disposition of the five posterior intestinal cells precludes a complete intestinal lumen unless the lumen passes through the cytoplasm of these cells or the intestinal cells are more than eight in number, but this could not be studied because of torsion of this organ or because of some other factor.

In the case of *Cylicocercus goldi*, L. observed that the intestinal lumen passes through the cytoplasm of the five posterior cells.

The morphological characteristics of the three species described are compared with those of numerous other horse strongyles.—L. E. Hughes.

Lombard, C. (1937). Contribution à l'étude anatomo-pathologique de la strongylose cardio-pulmonaire chez le chien. [**Cardio-Pulmonary Strongylosis in Dogs**].—*Rev. Méd. vét., Toulouse.* **89.** 525-530. [2 refs.]

L. examined P.M. 269 dogs from S.W. France of which 7·8% were affected by cardio-pulmonary strongylosis, and 133 bitches in which the incidence was 15·78%. Most were over three years old, but dogs aged from six months to 16 years were affected. All cases showed chronic visceral pleurisy in the form of bluish-white plaques varying in size and number, these lesions often being the only ones noted macroscopically. In a few cases pale-coloured pulmonary lesions of a soft rubber consistency were present. The pulmonary arteries were prominent because filled with non-adherent thrombi containing parasites, the lesion being a chronic vegetative endo-arteritis.

The parasite *Haemostrongylus vasorum* was found in the right heart once and once in the pulmonary artery.—C. V. Watkins.

Andrews, J. S. (1938). **Observations on the Cellular Elements and Haemoglobin in the Blood of Sheep Infected with the Nematode, Cooperia Curticei.**—*N. Amer. Vet.* **19.** No. 2. 40-44. 4 tables. [5 refs.]

A. briefly reviews the literature bearing upon this subject. Four pairs of Hampshire-Southdown cross-bred lambs were entered for experiment when approximately four months old. One of each pair received a known dosage of *C.c.* per day over varying numbers of days, and the other lamb was kept as a control. The progress of the infestation was checked by weighing the total amount of faeces passed per day and counting worm eggs present in a representative sample. At

intervals blood was obtained from the jugular vein and observations were made on the total and differential cell counts and the haemoglobin content.

The only significant change noted in the blood was a slight leucocytosis. —L. E. Hughes.

Cameron, T. W. M. (1937). **Trichinosis.**—*Canad. J. comp. Med.* **1.** No. 2. 5-14. 4 figs., 1 chart.

This article presents a brief but comprehensive survey of trichinosis. The incidence in man is given, together with the symptoms which, C. points out, are often mistaken for those of other diseases. Methods of diagnosis, treatment, resistance and the pathological picture are also included. The question of trichinosis in pigs is reviewed, as are the meat inspection regulations. Attention is directed to the high incidence of sub-clinical cases and to the prevention of trichinosis by the consumption of only thoroughly cooked or properly processed pork.—Chas A. Mitchell.

Renteria, J. R. (1937). Inspección y decomisos triquinoscos. Estadistica e inutilizaciones. [**Trichina Inspection in Argentina**].—*Rev. Med. vet., B. Aires.* **19.** 569-583.

A history of trichinosis in Argentina is given with statistics, and the methods of examination are detailed. In 3,261,575 pigs inspected from 1923 to 1934, calcified forms were found in 0·33 % and living forms in 0·007 %. A yearly decrease is noted.—A. H. Hunter.

I. Kreis, H. A. (1937). Die Entwicklung der Trichinellen zum reifen Geschlechtstier im Darme des Wirtes. [**Development of Trichinella to Maturity in the Digestive Tract of its Host**].—*Zlb. Bakt. I.* (*Orig.*). **138.** 290-302. 8 figs., 4 tables. [8 refs.]

II. Schmid, F., & Schipull, H. (1937). Beitrag zur Beurteilung der Brauchbarkeit der Hautreaktion zum Nachweis der Trichinose. [**The Value of the Skin Reaction in the Diagnosis of Trichinosis**].—*Z. InfektKr. Haustiere.* **51.** 165-175. [Numerous refs.]

I. Rats fed on trichinella-infested flesh were killed after varying intervals of time, and the trichinella examined. The various stages of the development of both sexes of the parasite are fully described and figured.

II. The skin reaction produced in g. pigs and swine when intradermally injected with trichinella antigen is described. From the examination of seven infected g. pigs and two swine, with two controls in each case, the reaction is judged to be specific. It is considered a useful aid to diagnosis, but not a substitute for P.M. examination for trichinella.—P. S. Watts.

IMMUNITY

Pirosky, I. (1938). Sur l'antigène glucido-lipidique des *Pasteurella*. [**The Glyco-Lipid Antigen of Pasteurella**].—*C. R. Soc. Biol. Paris.* **127.** 98-100. 3 tables. [4 refs.]

Using Boivin and Mesrobeanu's method [*V.B.* **6.** 441.] of extraction with trichloracetic acid, P. has obtained a glyco-lipid from *Pasteurella aviseptica*. The particular strain used gave smooth and rough colonies on agar plates. The rough colonies later gave rise to a smooth variant which remained smooth. The glyco-lipid was present in both smooth and rough variants, although there was

twice as much in the rough variant. It was toxic to mice when given intraperitoneally in a dose of 0·1 mg. It was antigenic and was also capable of reacting with anti-bacterial sera *in vitro*. Antiserum prepared by the inoculation of glyco-lipid was equal to anti-bacterial serum in protecting mice against the toxic effect of glyco-lipid.

This substance appears to be identical with those extracted from other Gram-negative organisms by Boivin and Mesrobeanu.—D. L. Hughes.

Szélyes, L. (1937). Kisérletek a sertésorbánc- és baromficholeraellenes szérumok értékének meghatározá ához. [**Titration of Swine Erysipelas and Fowl Cholera Antisera**].—*Állatorv. Lapok.* **60.** 249-255.

From comparative tests S. concludes that pigeons are the most suitable test animals for the titration of swine erysipelas serum, and white mice the most suitable for fowl cholera serum, as they have a uniform susceptibility for the respective organisms. In the case of S.E. the efficacy of antiserum depends on its mode of application, being greater when serum and culture are injected separately. In fowl cholera, on the other hand, the antiserum is more efficacious if mixed with culture before injection, whether by the intraperitoneal or subcutaneous routes.
—G. Sályi (Budapest).

DISEASES, GENERAL

Velu, H. (1938). Simple essai sur la climatopathologie vétérinaire marocaine. [**Veterinary Climatopathology in Morocco**].—*Maroc méd.* **18.** 3-13. [Numerous refs.]

The climate can affect the health of animals directly or indirectly. In the first category there are conditions such as phototraumatism and photosensitization, whilst in verminous diseases the climate and season indirectly are of paramount importance ; this also applies to diseases which require a vector such as theileriasis.

Anthrax is a more dangerous scourge where the climate permits the organism to lead a saprophytic existence. A form of chronic eczema occurring locally in Morocco in equines is probably due to climatic causes. An irido-cyclo-choroiditis is found only in the Sebou valley, and this may be due to electrical phenomena in that area.

Other diseases in Morocco such as avian pasteurellosis, equine infectious anaemia and Preisz-Nocard infection are associated with seasonal changes and have a definite, limited geographical distribution.

The fact that foot and mouth disease, tetanus, and other diseases take a milder form in Morocco than in France is probably due to the differences in the climates of the two countries.

The veterinarian's problem in Morocco is closely connected with the climate; infections frequently follow the results of feeding trouble caused by desiccation of the pastures.—H. S. Purchase.

Guidi. (1938). Tierkrankheiten im italienisch-abessinischen Krieg. [**Animal Diseases in the Italo-Abyssinian War**].—*Dtsch. tierärztl. Wschr.* **46.** 129-133. 8 figs.

Bad management, lack of good fodder, etc., were responsible for much colic. A respiratory disease of horses [? shipping fever] referable to environmental changes also occurred and responded to a week's rest. There were heavy losses from African horse-sickness, the various forms of which are described. Other

infectious diseases encountered were epizootic lymphangitis, infectious conjunctivitis, and trypanosomiasis. Mange in horses, mules and camels was prevalent; treatment with cresols was satisfactory. *Rhipicephalus* and *Ixodes* ticks were common; so also were leeches, which caused trouble when numbers were attached to the nasal or buccal mucous membranes. *Gastrophilus equi* and *Filaria* were also found.—P. S. Watts.

Schilling, C. (1937). Le epizoozie in Africa ed i loro rapporti con le malattie infettive dell'uomo. [**Animal Diseases of Africa**].—*Profilassi.* **10.** 121-125.

S. stresses the importance of co-operation between medical and veterinary research, in view especially of the advantages the latter enjoys in the field of controls for the testing of such questions as to whether immunized subjects produce immunized offspring. He refers to experiments carried out in India on malaria in monkeys, and suggests that they should be extended to African monkeys, and discusses the connexion between human and animal trypanosomiasis. He believes that similar methods may be found of vaccinating against rinderpest in cattle and yellow fever in human beings.—S. F. J. Hodgman.

I. Schäper, W. (1936). Züchtung seuchenresistenter Haustiere. [**The Breeding of Disease-Resistant Domestic Animals**].—*Züchtungskunde.* **11.** 449-455. [1 ref.]

II. Willie, R. (1938). Die Aufgaben der Erbfehlerforschung. [**Data from Research on Inherited Defects in Animals**].—*Tierärztl. Rdsch.* **44.** 31-33.

I. Since it has been possible to breed disease-resisters in the case of small laboratory animals, S. considers that it should also be possible to build up disease-resistant herds of the larger domestic animals.

II. The hereditary defects of animals are divided into two classes:—(1) those causing death, *e.g.*, absence of anal orifice, or for which the animal is destroyed, *e.g.*, skeletal defects, and (2) defects generally undectable at birth, which do not lead to natural death or necessitate destruction, *e.g.*, cryptorchidism. A list is given of the various defects, arranged according to the different species of animals, together with short notes on most of those mentioned.—P. S. Watts.

Despret, E. (1937). Les maladies infectieuses du chat. Essai de classification. Essai de transmission au chat du virus de la maladie de Carré. [**The Classification of Virus Diseases of Cats. An Attempt to Transmit Dog Distemper Virus to Cats**].—*Thesis, Alfort.* pp. 70. 1 table, 11 graphs. [Num. refs.]

D. describes the following six diseases of cats:—cat distemper, infectious gastro-enteritis, acute coryza, influenza, infectious angina and contagious ulcerative glossitis [cf. Smythe. *V. B.* **5.** 577].

Much research has been carried out on cat distemper, which is now known to be a virus infection associated with a high mortality [see *V. B.* **6.** 337]. Infectious gastro-enteritis is also well known [see *V. B.* **5.** 19 and 495].

Acute coryza attacks cats of all ages and may be sporadic or may spread quickly among cats. The inflammation may or may not spread to the eyes, mouth, head sinuses and pharynx, but when it does, death usually follows. Mild cases recover after one or two weeks' illness.

Infectious angina is characterized by diphtheroid inflammation centred in the pharynx; affected cats cough and have difficulty in swallowing. Young ones usually die as a result. [The differentiation between this condition and the acute coryza does not appear to be clearly described]. Cat influenza is similar clinically to acute coryza, but recovery usually follows after five or six weeks' illness.

In contagious ulcerative glossitis the tongue is the primary seat of a severe destructive inflammation which may extend to the cheeks and pharynx ; it sometimes occurs in distemper and gastro-enteritis. The mortality rate is said to be low.

To test the susceptibility of cats to dog distemper, D. inoculated five cats subcutaneously with a spleen tissue filtrate of an infected ferret, another cat being given filtrate of normal ferret spleen as a control. All five test cats reacted with slight fever from the second to the seventh day, whilst the control showed no reaction. It was concluded that cats are not susceptible to dog distemper, the reactions being presumably attributed to non-specific factors.—J. E.

I. Grzimek, B. (1937). Der Geflügel-gesundheitsdienst—eine neue Art der Krankheitsbekämpfung in Verbindung mit züchterischen Massnahmen. [**The Poultry Health Service in Germany —Diagnosis Service**].—*Tierärztl. Rdsch.* **43.** 646-647. 2 figs.

II. Beller, K. (1937). Geflügelkrankheiten und Geflügel-gesundheitsdienst. [**Poultry Diseases and the Poultry Health Service**].—*Münch. tierärztl. Wschr.* **88.** 517-520.

I. A description of the poultry breeding organization in Germany. Every year millions of chicks are distributed at a low cost to the farmers in a state subsidy scheme. All poultry breeders, of which there are about one thousand, owning a total of 600,000 breeding hens, are under the supervision of the poultry health service of the Reichsnährstand.

The country is divided into districts, each of which is administered by a veterinary institute, and state veterinary surgeons are sent periodically to inspect all poultry farms. Poultry breeders are obliged to send dead fowls for diagnostic examination, and once a year 10% of all the hens are tested for pullorum disease, and their eyes are examined at the same time for changes indicative of fowl paralysis. Disease control measures are put into force as required.

II. B. points out the importance of constitutional weakness as a factor in the aetiology of diseases of poultry, and emphasizes the importance of breeding methods which will eliminate weak stock.—Sassenhoff (Munich).

I. Beller, K. (1936). Stand und Bewegung der nicht anzeigepflichtigen Geflügelseuchen. [**Non-Notifiable Fowl Diseases in Germany**].—*Berl. tierärztl. Wschr.* **52.** 629-632. 5 charts.

II. Taut, K. (1936). Jahresbericht über die deutschen Legeprüfungen für Hühner 1934/35. [**Annual Report of the German Laying Trials in 1934-1935, Including Mortality**].—*Arch. Geflügelk.* **10.** 237-252. 11 tables, 1 map.

III. Taut, K. (1937). Jahresbericht über die deutschen Legeprüfungen für Hühner 1935-1936. [**Annual Report of the German Egg Laying Trials in 1935-1936, Including Mortality**].—*Ibid.* **11.** 145-161. 13 tables.

IV. Taut, K. (1938). Jahresbericht über die deutschen Legeprüfungen für Hühner 1936-37. Im Auftrag des Reichsverbandes Deutscher Kleintierzüchter erstattet. [**Report of the German Egg-Laying Trials 1936-1937 Including Mortality**].—*Ibid.* **12.** 1-20. 13 tables. [English summary].

I. A general review which should be seen in the original of poultry diseases in Germany in the six years up to 1936. During the period, *Salmonella pullorum* infection and coccidiosis decreased, and fowl pox and coryza appeared to be decreasing. Tuberculosis and leucosis showed no change in incidence during the period, but fowl paralysis increased. B. stresses the importance of non-specific causes of poultry mortality.

II. Two kinds of egg-laying trials take place in Germany. To one the poultry breeder sends his five best hens and, in the other, selections are made by an outside official from all hens in the competing flocks. The causes of loss are given; the monthly loss varied between 0·6% and 11%, and totalled 12·3% of all the hens in the trials. The majority of deaths were put down to diseases of the urinary and genital tracts.

III. In this year the total losses were 10%, and as before, the majority of deaths were due to urinary and genital diseases; 17·9% of hens died from leucaemia or fowl pox, 9·8% from endoparasites, 8·7% from TB. and 7·6% from digestive diseases.

IV. The total loss in laying hens rose to 12·6%. Virus diseases accounted for 27·4% of the deaths, worm infestation for 9·1%, bacterial infections for 8·3%, and metabolic disorders for 7·5%. As classified according to the affected organs, 17·9% were uro-genital diseases, 15·8%, diseases of the digestive tract, and 5·8%, those of nervous system.—SASSENHOFF (MUNICH).

MOUTAUX. (1938). Un syndrome hémorragique particulier à la jument en gestation. [**A Haemorrhagic Syndrome Peculiar to the Pregnant Mare**].—*Rec. Méd. vét.* **114.** 138-140.

M. describes a fatal condition observed towards the end of pregnancy in three primiparous mares. The initial symptoms resembled those of haemoglobinuria, but were less acute. The pathognomonic feature, appearing 12-14 hours before death, was a hot, painless swelling in the flank in front of the stifle-joint. This developed rapidly, and quickly extended round the abdominal and perineal regions. Death occurred within 36 hours after the onset of symptoms. The subcutaneous and intramuscular tissues in the region of the swelling were infiltrated with considerable quantities of venous blood. The haemorrhage was considered to result from compression of the iliac veins by the gravid uterus.—N. J. SCORGIE.

MIESSNER, H., & HARMS, F. (1937). Virusabort der Stuten. [**Virus Abortion in Mares**].—*Dtsch. tierärztl. Wschr.* **45.** 685-689. 1 fig., 3 tables. [5 refs.]

Seventeen of 23 pregnant mares aborted on a stud farm. The condition appears to have been infectious and to have spread by direct contact of animals at grass and indirectly through attendants. Abortion occurred at 9-11 months. It was thought that stallions were the source of infection. Mares aborted suddenly, and occasionally slight uterine catarrh occurred afterwards, but usually the animals remained healthy. The chorion showed no abnormality: the foetuses were alive, but died soon after birth. Seven of 12 mares became pregnant when served again.

The foetuses showed enlargement of the liver and spleen and hydrothorax and ascites. Extensive examination of foetuses and chorions for bacteria and trichomonads yielded negative results. Mares' serum failed to agglutinate *Bact. abortus equi* one week after abortion. Of 11 pregnant g. pigs inoculated (subcut. and intraperit.) with material from organs of affected foetuses filtered through cotton wool, 3 aborted. 8 were inoculated with Seitz filtrate of foetal organs and one aborted. A cotton wool filtrate of one of the three aborted g. pigs caused abortion in one out of four g. pigs. A sterile filtrate from the latter case caused abortion in two g. pigs and so on to a fourth passage. All g. pig foetuses were bacteriologically sterile. No attempt was made to retransmit the infective agent back to pregnant mares.

For prophylaxis, strict hygienic measures are recommended during pregnancy.

[The evidence that the infection was due to a virus is not very strong;

only four out of 19 g. pigs aborted when injected with cotton wool filtrate; and it is well known that pregnant g. pigs readily abort after being handled]. —D. Slavin.

Macridès, J. (1936). Les mammites des petits ruminants. [**Mastitis in Small Ruminants**].—*Thesis, Alfort.* pp. 70. 3 tables. [Numerous refs.]

A description of the various forms of mastitis in sheep and goats in Greece :– gangrenous mastitis caused by *Micrococcus mastitidis gangrenosae ovis* Nocard, 1887, contagious mastitis caused by *Bact. mastitidis* Dammann and Freese, 1907, contagious agalactia caused by a filtrable virus, and sporadic types.

The thesis contains many quotations from the literature and a good classified reference list.—J. E.

Kühle, E. (1937). Versuche über den Nachweis von Gallenfarbstoffen im Harn bei lebergesunden und leberkranken Schlachtrindern. [**Demonstration of Bile Pigments in Urine of Cattle with Healthy and Diseased Livers**].—*Inaug. Diss., Berlin.* pp. 35. Numerous tables. [17 refs.]

Using various methods, K. examined 225 samples of urine from cattle with healthy and diseased livers. The methods of Gmelin, of Rosin and of Kallos gave in every case negative reactions for bilirubin, but by using Krokiewicz and Batko's method it was detected in a number of samples from healthy and diseased cattle. Urobilin was detected in the urine by means of the diazo and zinc acetate tests, but again its presence was no indication of disease of the liver, as it was found on a number of occasions in urine from healthy cattle.—J. A. Nicholson.

McIntosh, R. A. (1938). **Interruptions in the Physiology of Reproduction and their Relation to Sterility.**—*Canad. J. comp. Med.* **2.** 33-38.

The author deals with the forms of sterility produced by physiological processes, *viz*, endocrine disturbances, nutritional deficiencies, etc. Sterility due to pathological changes and infections is better understood, whereas that resulting from the first mentioned factors is not so well known. The author describes methods of treatment, commenting particularly upon possible food deficiencies and the ways in which they may be supplemented.—L. B.

Berge, & Pallaske. (1937). Beitrag zur Frage der Pathogenese der sog. schleimigen Degeneration der Nasenmuschel des Pferdes. [**Pathogenesis of Mucoid Degeneration of the Turbinate Bones in the Horse**].—*Dtsch. tierärztl. Wschr.* **45.** 825-829. 7 figs. [13 refs.]

B. observed four cases of mucoid degeneration of the turbinate bones in young horses, and P. did the histological work. The bony laminae had been broken down by the activity of osteoclast cells and their place taken partly by a disorganized bony tissue and partly by fibro-polypoid tumour-like growths. The mucous membrane was oedematous. From a general consideration of the condition and after a comparison in the light of human pathology, the authors conclude that this so-called mucoid degeneration is an inflammatory process. They suggest that it begins as a catarrhal suppurative inflammation of the nasal cavities, possibly predisposed to by congenital abnormalities, such as stenosis of the naso-maxillary opening.—F. Freudenberg (Hamburg).

Weiss, K. (1937). Ein Beitrag zur Frage der Erblichkeit des Kehlkopfpfeifens unter besonderer Berücksichtigung der Blutlinienforschung. [**Heritability of Roaring in Horses**].—*Inaug. Diss., Berlin.* pp. 70. 18 tables. [Num. refs.]

After examining the incidence of roaring in a number of strains of thoroughbred

horses, W. decided that either the defect was hereditary or predisposition was inherited. In one strain, 22 out of the 28 descendants of a certain stallion developed into roarers.—P. S. Watts.

Bambauer. (1938). Seuchenhafte Hornhautentzündung bei Rindern? [**Contagious Keratitis in Cattle**].—*Tierärztl. Rdsch.* **44.** 188-190.

A keratitis of cattle is described which occurs only in the autumn. One attack does not confer any immunity, and the disease cannot be transmitted from one animal to another. B. considers it primarily a vitamin A-deficiency, with superadded infection of the cornea. It responds to treatment with disinfectant eye lotions and vitamin-rich foods. He suggests that periodic ophthalmia of horses is of a similar nature.—P. S. Watts.

Westhues, M. (1937). Ueber das Wesen und die Behandlung des Hufkrebses. [**Nature and Treatment of Hoof Canker**].—*Berl. tierärztl. Wschr.* July 9th. 436-440.

W. gives results of ten years' observations on canker of the hoof. He describes the condition as a secondary parakeratosis, the term implying a disease process in the tissues adjacent to the hoof matrix—a softening and decomposition of the hoof horn, which results in the production of the characteristic growths which can always be suppressed by a pressure bandage alone, without the use of any chemical or surgical operation. He considers that the primary parakeratosis, whatever it may be, cannot be prevented.

In order to study the origin of canker and the relation of it with thrush, W. experimented for nine months on 18 hoofs of 14 horses, applying pressure bandages soaked in water, caustic potash and horse faeces; in some cases the horn was pared thin. In four horses, stable manure was applied by a bandage which was soaked daily with stable drainings. All the horses became affected with thrush, but none with canker.

In eight horses which already had canker in one hoof, an unsuccessful attempt was made to cause it in another hoof. It was impossible to transfer canker from one part of a hoof to another normal part. In no case did thrush develop into canker. W. concludes that the cause of canker is not purely local, but that some general bodily disturbance is invoked in its causation.

Numerous methods of treatment were tried, such as changing the diet for 2-4 months from hay alone to oats alone or by the giving of vitamin A, vitamin D, prolan, or a suspension of testicular tissues. Exercise, rest, venesection and treatment of affected horses with serum of recovered ones were also unsuccessful. Detailed instructions are given for treatment, which consists of the usual pressure dressing with the shoe applied.—F. Freudenberg (Hamburg).

Metzger, H. J., Hull, F. E., & Ely, F. (1937). **Albuminuria and Nephritis in Dairy Cows.**—*Bull. Ky agric. Exp. Sta.* No. 373. pp. 91-118. 6 figs., 10 tables. [7 refs.]

As nephritis had been prevalent in the Kentucky Experiment Station samples of urine from the cows were examined for albumin over a period of six years. The herd was self-contained and averaged 62 cows and heifers of breeding age. Certain of the cows showed albuminuria from early life, in one case ten days after birth, and the majority of these finally developed nephritis. The lesions in the kidneys varied widely, as did the bacterial flora. *Bact. coli*, non-haemolytic streptococci or staphylococci were isolated from them either mixed, or in pure culture.

A transitory albuminuria with nothing to account for it was occasionally met with such as accompanies febrile diseases *e.g.*, mastitis, pneumonia, enteritis, etc. Nephritis could be diagnosed on the appearance of a persistent albuminuria accompanied by chronic indigestion. Urinary antiseptics were of little value in treatment.

It is suggested that early appearance of persistent albuminuria which increases in severity gradually reduces the resistance of the kidneys, rendering them liable to infection by various organisms normally present in the urinary tract, also that some strains of cattle are much more susceptible to factors affecting the kidneys than are others.

Calculi from nephritis cases occurred in a few of the cows and were usually composed of magnesium phosphate, magnesium ammonium phosphate, a small amount of tricalcium phosphate and about 20% of organic matter.—J. A. N.

Bloom, F. (1937). **A Clinical and Pathological Study of Nephritis in Dogs.**—*J. Amer. vet. med. Ass.* **91.** 679-699. 10 figs. [15 refs.]

This is a general consideration of the subject and it contains no new material. —J. W. H. Holmes.

I. Czymoch, O. (1937). Beitrag zur Aetiologie der Rinderleukose in Ostpreussen. [**The Aetiology of Bovine Leucosis in East Prussia**].—*Z. InfektKr. Haustiere.* **52.** 187-220. Numerous tables, 1 map. [Numerous refs.]

II. Feuerherm, M. (1937). Untersuchung über die Verbreitung der Rinderleukose. [**The Distribution of Bovine Leucosis**].—*Inaug. Diss., Berlin.* pp. 38. 4 figs., 10 tables. [Numerous refs.]

I. C. examined 321 farms during a period of ten years. He discusses leucosis with reference to methods of farming, size of herd, type of ground, season of year, geographical position, age of cattle, hereditary factors, feeding stuffs, minerals, liver fluke, stomach worms, lung worms, abortion, Johne's disease and tuberculosis. He found no definite evidence of hereditary influence, but noted that the later calves of any cow were more prone to develop the disease. It occurred mainly on wet, marshy land, and it is possible that mineral deficiency or the high silicic acid content of grasses kept short by grazing were predisposing factors. C. suggests food, soil and blood analyses as further lines of investigation.

II. Leucosis is spreading steadily and increasing in incidence in Prussia. There is no seasonal variation or particular geographical distribution. The aetiology remains obscure, but F. suggests that a statistical review of ten thousand cases should be undertaken.—P. S. Watts.

I. Perkas, M. (1936). Indolversuche am Huhn. (Beitrag zur Erforschung der Hühnerleukose.) [**Effect of Subcutaneous Injection of Indol on Fowls —Connexion with Leucosis**].—*Schweiz. Arch. Tierheilk.* **78.** 371-375. [14 refs.]

II. Schmitt, H. (1936). Blutuntersuchungen bei gesunden und an Erythrose erkrankten Hühnern. [**Blood Picture of Healthy Fowls and Fowls with Erythroleucosis**].—*Inaug. Diss., Giessen.* pp. 35. 2 tables. [Numerous refs.] [Also appeared in *Z. InfektKr. Haustiere.* **51.** 185-191].

III. Schaaf, J. (1937). Die Leukose und Erythrose des Huhnes und ihre Bekämpfung. [**Avian Leucosis and Erythrosis**].—*Dtsch. tierärztl. Wschr.* **45.** 405-408. 6 figs.

I. It has previously been found that the injection of indol causes leucaemia in white mice. P. carried out similar tests on fowls, which were given solutions of indol subcutaneously in gradually increasing concentrations and doses, but in no

case was leucosis set up, although the injections caused a leucocytosis and a slight reduction in the R.B.C. count.

II. S. compared the blood picture of healthy fowls and fowls with erythroleucosis ; in the latter the first change noticed is a fall in the R.B.C. and haemoglobin. There is at first an increase in the leucocytes, but later a decrease. The leucocytosis is an indication that the haemopoietic system has been irritated, with the result that abnormal cells are thereafter produced, such as erythroblasts, erythrogonia and myeloid cells. In addition there is in erythroleucosis a decrease in blood viscosity, an increase in the sedimentation rate, a decrease in the cell proportion in the blood clot and in the albumin content, and an increase in the blood globulin. None of the observed cases of erythroleucosis made a spontaneous recovery.

III. This is substantially the same as an article published elsewhere [*V. B.* **8.** 597].—Sassenhoff (Munich).

Fritzsche, K. (1937). Versuche zur Erforschung und Bekämpfung der Marekschen Hühnerlähme. I. Versuche über die Ausscheidung des Hühnerlähmevirus mit dem Kot und über die natürliche Infektionsweise. [**Research on Fowl Paralysis. The Excretion of the Virus in the Faeces**].—*Z. InfektKr. Haustiere.* **52.** 51-69. 9 tables. [Numerous refs.]

The droppings of four hens clinically affected with fowl paralysis were diluted in normal saline and filtered through kaolin and through a Seitz filter. Signs of fowl paralysis appeared in hens ten days after injection subdurally and intramuscularly with 0·2 c.c. and 0·4 c.c. respectively of the filtrate. Ten-day-old chicks showed signs of the disease 14 days after ingestion of unfiltered droppings from the affected hens. For control purposes, 50 healthy hens were examined histologically, and isolated perivascular infiltrations of the brain and sciatic nerves were found in seven. It is consequently advised that a positive diagnosis of fowl paralysis, based on histological examination of nerve tissue, should only be made if the infiltrations are extensive.—Sassenhoff (Munich).

Pallaske, G. (1938). Weitere Untersuchungen über die Aetiologie des Herztodes des Schweines. [**Further Research on Syncope in Pigs**].—*Tierärztl. Rdsch.* **44.** 53-60 and 69-72. 9 figs. on 1 plate. [5 refs.]

Race and sex have no influence on the susceptibility of swine to heart failure. Most cases are encountered between the ages of 4-9 months and again from 2-4 years. P. considers that anaemia, due either to parasites or to bad hygienic conditions, may possibly play some part in the aetiology of the disease. Feeding of bad food is a probable cause of the condition, and also over-feeding for fattening, and more so if sloppy foods are used. The actions on swine of insulin, adrenalin, histamine, thyroxine, phenylhydrazine and solanine were studied as part of the investigation into the condition ; P. states that too few animals were used to enable him to draw conclusions, but he considers that swine are particularly susceptible to insulin. He is of the opinion that the adoption of better feeding and hygienic conditions, and especially free ranging of young stock, would prevent syncope.
—P. S. Watts.

Cohrs, P. (1938). Der derzeitige Stand der ätiologischen Krebsforschung in der Veterinärmedizin. [**The Present Position of Aetiological Research on Cancer in Veterinary Medicine**].—*Dtsch. tierärztl. Wschr.* **46.** 169-173. [10 refs.]

A general dissertation on the various theories of the causes of cancer. No new facts are mentioned.—P. S. Watts.

ZUCKERMAN, S., & MCKEOWN, T. (1938). **The Canine Prostate in Relation to Normal and Abnormal Testicular Changes.**—*J. Path. Bact.* **46.** 7-19. 4 tables, 1 graph. [15 refs.]

The prostate and testes of 243 dogs were examined histologically. The prostates were measured, and after fixation their volumes were determined by displacement of water. The average measurements are given for different breeds in three age groups, *viz*, sexually immature, mature dogs up to five years and mature dogs of six years and over. The figures show no relationship between breed and size of prostate, and in each age group the size of the prostate varies considerably. Enlargement may take place after sexual maturity is reached, and at about the eighth year of life the prostate may either continue to enlarge or else undergo involution, both changes being equally common. Enlargement is due either to glandular hyperplasia or, occasionally, to squamous metaplasia which results from spontaneous oestrogenic stimulation [see *V. B.* **7.** 546]. Involution was most pronounced in two castrated dogs.

Testicular tumours were present in 35 dogs. Three were neoplasms of the interstitial cells, the corresponding prostates being normal. Seventeen were seminomata, the prostate being normal. The remaining 15 were classified as adenocarcinoma, the prostates of nine of these dogs being normal; those of five showed squamous metaplasia and one showed carcinoma.—A. T. PHILLIPSON.

I. KRÖMKER, F. (1937). Ein Beitrag zum Blutbild gesunder und kranker Hühner unter besonderer Berücksichtigung der Erythrozyten und des Hämoglobingehaltes. [**Blood Picture of Healthy and Sick Hens with some Remarks on the Erythrocytes and the Haemoglobin Content**].—*Inaug. Diss., Berlin.* pp. 41. 9 tables. [Numerous refs.]

II. BLECH, K. (1937). Blutzuckerstudien am Huhn. [**Blood Sugar Studies in Fowls**].—*Inaug. Diss., Berlin.* pp. 40. 3 figs., 15 tables. [Numerous refs.]

I. The erythrocyte, leucocyte and haemoglobin contents were estimated in 68 white Italian and white American leghorns between the ages of 6-18 months. All birds were clinically examined before blood was taken; afterwards they were killed and diagnosis of health or disease was confirmed by P.M. examination. The average figures found for 27 healthy birds were :– erythrocytes 3,579,644 per cmm.; leucocytes 35,592 per cmm., and haemoglobin 65·78% (variation 53-74%). Of 41 sick birds examined, the haemoglobin content was found to have significant variation in birds affected with fowl paralysis or coccidiosis; the average figures are 81·8% (ten cases) and 78·7% (seven cases) respectively. Other conditions examined were catarrhal enteritis, leucosis (leucocyte count not recorded), worm infestation, cold abscess, inflammation of the oviduct, gout, and combinations of these conditions.

II. The method of Hagehorn and Jensen was used in all blood sugar estimations. The normal values were found to be between 125 and 230 mg. %, arterial blood always giving a slightly higher figure than venous blood. Eleven experiments showed no bleeding hyperglycaemia even when 8% of the total blood volume was withdrawn. In two experiments over a 25-hour period the blood sugar increased during the day and decreased during the night. The introduction of glucose and galactose solutions into the stomach produced a pronounced hyperglycaemia, the blood sugar rising and falling again more quickly with the glucose solutions than with galactose. Fructose produced a hypoglycaemia. The introduction of sugar solution into the crop caused two waves of hyperglycaemia, the first immediately and the second 3-6 hours after the introduction of the solution.—A. T. PHILLIPSON.

Reibel, J. (1937). Graminacea perjudicial para la salud de los bovinos. **[Gastric Concretions Formed by *Paspalum* in Cattle].**—*Rev. Med. vet., B. Aires.* **19.** 558-560. 1 fig.

Paspalum Chepica is found in Argentina (province of Jujuy) growing to a height of 2-8 inches. The leaves are covered with " hairs " about half an inch in length, and are evidently relished by cattle after the excessive growth following abundant rainfall. The hairy leaves are not all eliminated, but form " hair balls " in the omasum, fourth stomach and intestines. [No details are given of resultant illness, if any].—A. H. Hunter.

NUTRITION IN RELATION TO DISEASE

Tufts, E. V., & Greenberg, D. M. (1938). **The Biochemistry of Magnesium Deficiency. I. Chemical Changes Resulting from Magnesium Deprivation. II. The Minimum Magnesium Requirement for Growth, Gestation, and Lactation, and the Effect of the Dietary Calcium Level Thereon.**—*J. biol. Chem.* **122.** 693-714 and 715-726. 11 figs., 11 tables. [Numerous refs.]

I. Mg deficiency induced by feeding rats on a diet low in Mg shows itself in two phases, the first characterized by vasodilatation, hyperaemia and hyperexcitability, with little retardation of growth, and the second by malnutrition, cachexia and kidney damage, with a greatly retarded growth rate. Plasma Mg drops rapidly and then rises to a peak after the stage of hyperexcitability, falling off again slowly to reach values of about 1 mg. %. In the early stages of the deficiency the Mg content of the red corpuscles is reduced to half the normal, thereafter remaining constant at this low level. The Mg content of the soft tissues, with the possible exception of brain and muscle, undergo little alteration, although the Ca content increases in the heart muscle, and markedly in the kidneys. The total Mg content of the body is usually not decreased under these conditions.

II. On diets containing adequate Ca and vitamins, a magnesium level of 5 mg. per 100 g. food was on the border line for good growth. Females on this diet produced normal young of normal Mg content, but during suckling the young rats developed symptoms of deficiency at 2-3 weeks old, and the percentage Mg of their bodies did not increase as with normal young, suggesting a Mg deficiency in the mother's milk. Raising the Ca content of the diet increased the severity of the Mg deficiency and raised the amount of Mg necessary to meet normal requirements. The minimal requirements are also raised by diminishing the vitamin G (B_2) intake, although the B complex seems to bear no direct relation to the state of malnutrition developed in consequence of Mg deficiency.—Alfred Eden.

Wilgus, H. S., Jr., Norris, L. C., & Heuser, G. F. (1937). **The Role of Manganese and Certain other Trace Elements in the Prevention of Perosis.**—*J. Nutrit.* **14.** 155-167. 3 tables. [18 refs.]

Experiments were carried out to determine the perosis-preventing factor in the diet of chicks. This factor was found to be present as an impurity in some mono-calcium phosphate used by the authors, which proved to contain a small amount of Mn. Analysis of bone ash from the hocks of normal and diseased birds showed that Mn was present in the former, but not in the latter, and further experiments showed that Mn had, in fact, a high preventive value against perosis. Zn and Al had a similar action, but to a lesser degree; a mixture of Mn, Al and Fe was entirely preventive in the presence of low Ca and P rations. Detailed tables are given of the experiments.

Marston, H. R., Lines, E. W., Thomas, R. G., & McDonald, I. W. (1938). **Cobalt and Copper in Ruminant Nutrition.**—*Nature, Lond.* **141.** 398-400. 1 fig.

The historical sequence of events that led up to the use of Co supplements in preventing and curing " bush sickness " is reviewed. As is well known, this New Zealand disease is closely related to enzootic marasmus (W. Australia), coast disease (S. Australia), pining (Cheviots and Inner Hebrides), nakuruitis (Kenya) and salt-sickness (Florida). Aston *et al.* cured affected animals by massive doses of Fe salts (probably contaminated with traces of other elements) and for economic reasons A. suggested the use of the native iron ore limonite which gave highly beneficial results, provided that the ore came from certain specific deposits. Filmer (1933), working on enzootic marasmus in W. Australia, found that limonite was most effective as a preventive and prophylactic measure, but that pure Fe salts were ineffective. In collaboration with Underwood, he found HCl-extracts of the ore even when freed from practically all traces of Fe to be equally effective, but Underwood was unable to identify the actual element responsible. Meanwhile, the work of Walthners on the production of polycythaemia in rats by Co had suggested Co therapy to the S. Australia workers, with immediate results. Underwood then identified Co in his HCl-extracts of limonite and applied Co effectively to the cure of enzootic marasmus. Askew and Dixon (1936) then demonstrated the success of Co therapy in bush-sickness.

The enzootic ataxia of lambs in S. Australia (resembling English swayback) characterized by degeneration of the brain and spinal cord, appears from the work of Bennetts (1937) to be due to a Cu deficiency and can be prevented by administration of Cu supplements to the pregnant ewes. Even Co-treated animals require Cu to be maintained in good health. It is suggested that these diseases may be due to a breakdown of a chain of metabolic events of which Co is a link, and stress is laid upon the furtherance of the knowledge of the physiological importance of these elements in animal nutrition.—Alfred Eden.

Askew, H. O., & Maunsell, P. W. (1937). **The Cobalt Content of Some Nelson Pastures.**—*N.Z. J. Sci. Tech.* **19.** 337-342. 4 tables. [5 refs.]

Data referring to the cobalt content of a number of Nelson pastures, taken at regular intervals through the year, are presented. Similar data are included for paddocks which have been top-dressed with cobalt chloride at rates varying from 2 lb. to 112 lb. per acre. The cobalt content of the pasture was markedly increased by such treatment. The application of calcium carbonate at the rate of one ton per acre appeared slightly to depress the intake of cobalt by the grass.—L. W. N. F.

Dixon, J. K. (1937). **A Trial of the Effect of Cobalt Drench on Milk Production of Cows at Morton Mains.**—*N.Z. J. Sci. Tech.* **19.** 343-344. 2 tables. [3 refs.]

Cows were grazed on country considered to be deficient in cobalt for sheep, but on which no cattle sickness attributable to cobalt deficiency had been recorded, although cattle kept on the land gave a low milk yield ; the experiment was carried out to determine whether administration of cobalt would increase milk production in cows in these circumstances.

Pairs of cows with similar milk yield were selected from two herds ; one of each pair was given cobalt (4 mg. twice weekly), and the other, none. The milk yield of all the cows fell during the course of the experiment, which lasted 5 months in one herd and two months in the other, no significant advantage being conferred by the cobalt supplement.—L. W. N. Fitch.

Smith, D. T., Persons, E. L., & Harvey, H. I. (1937). **On the Identity of the Goldberger and Underhill Types of Canine Blacktongue. Secondary Fuso-Spirochetal Infection in Each.**—*J. Nutrit.* **14.** 373-381. 1 fig. [Num. refs.]

Dogs on the Underhill diet (raw beef, cracker meal, cottonseed oil, yeast and a salt mixture) developed blacktongue, and were cured by cod liver oil, yet the same symptoms developed when dogs received the Goldberger diet (yellow corn meal, peas, casein, sucrose, cottonseed oil, cod liver oil and a salt mixture) and they were cured by yeast or meat. In both cases the chief symptom was oral necrosis, fuso-spirochaetal organisms being found in the lesions. These organisms are found in small quantities in the mouths of normal dogs, but when they are injected into g. pigs, they cause local skin lesions, and may therefore be considered as potentially pathogenic. Symptoms identical with those of blacktongue can also be produced by injections with scillaren B, a squill glucoside.

The authors conclude that the lesions of the different types of canine blacktongue are caused by fuso-spirochaetal organisms normally present in the dog's mouth, but that these organisms can only set up the disease when the system has been disturbed by faulty nutrition or drug intoxication.

Sebrell, W. H., Onstott, R. H., & Hunt, D. J. (1938). **The Black-Tongue Preventive Value of Whole Whey, Delactosed Whey, and American Cheese.** —*Publ. Hlth Rep., Wash.* **53.** 72-83. 2 tables. [3 refs.]

It is pointed out that other workers have found whole milk, canned evaporated milk, and lactose whey powder to be of value in the prevention of blacktongue.

In the experiments carried out, dogs were fed on a blacktongue-producing diet, and the various products were fed as supplements.

Eight dogs were given whole whey, five delactosed whey, and five "American cheese."

Details are given of the behaviour of each dog, and the authors conclude that all three products are very poor sources of the blacktongue-preventive factor.
—W. J. Ironside.

Moore, L. A., & Hallman, E. T. (1936). **Production of White Spotted Kidneys in Calves.**—*J. Dairy Sci.* **19.** 434-435.

A short report on the occurrence of white spotted kidneys in calves fed on a vitamin A-deficient ration. The condition is also associated with pneumonia and " scours ". As the feeding of carotene seems to possess some preventive properties, the authors think that the condition may be related to vitamin A-deficiency. [For other references to this condition, see *V. B.* **6.** 315 and 795, and **7.** 546].
—N. J. Scorgie.

Kuhlman, A. H., Gallup, W. D., & Weaver, E. (1936). **Two Types of Blindness in Cattle and their Possible Relation to Vitamin Deficiency.**—*J. Dairy Sci.* **19.** 433-434.

Two distinct forms of blindness occurred in calves fed from the age of 45-60 days on skim milk, beet pulp, and cottonseed and bone meals. The symptoms of the first type indicate that the condition is a typical ophthalmia due to vitamin A-deficiency. In the second form, blindness is permanent, and may occur simultaneously with, or independently of the first ; there are no inflammatory symptoms, but the pupil is always dilated. Large doses of vitamin A and vitamin D over long periods do not restore sight. The condition may be due to constriction of the optic nerve.—N. J. Scorgie.

Michalka, J. (1937). C-Avitaminose (Skorbut) beim Schwein. [**Scurvy in Swine**].—*Wien. tierärztl. Mschr.* **24.** 577-590. 8 figs., 1 table. [16 refs.]

Six piglets over eight weeks old from the same litter were fed for 92 days on food which had been boiled for one hour in order to destroy its vitamin C content. At the end of that time four of them were infected with swine erysipelas and two with swine fever, to find out whether these diseases would aggravate the avitaminotic state and produce clinical scurvy. At the same time five other piglets from the same litter which had been receiving ordinary food containing vitamin C were also infected with S.E. or S.F. All the animals were killed at the height of the respective infections and it was found that the test piglets showed definite signs of scurvy, whilst the controls, of course, showed no signs of it.

After this experiment all piglets sent to the laboratory for routine diagnostic examination were examined for scurvy by M. and in 25 out of 196 (12·7 %) scurvy was diagnosed, while in a further 26 cases there was a suspicion of the disease. In four of the animals with scurvy, purpura was also observed.

The diagnosis of scurvy was based on examination of the gums for ulcerative gingivitis and loosening of the teeth and on a tendency to haemorrhage and purpura. The latter is present in the pre-scorbutic stage and is difficult to distinguish from swine fever, in which the gums are not abnormal. Haemorrhagic diathesis is an important diagnostic point in scurvy.—G. Hartmann (Vienna).

Norris, L. C. (1938). **Influence of Manganese on Perosis, Egg Production and Hatchability.**—*Harper Adams Util. Poult. J.* **23.** 117-118.

A short summary of the factors concerned in the aetiology of perosis in chicks. It appears that 50 parts manganese sulphate per million parts of the ration is the optimum level for prevention. Manganese has also been shown to play an important role in egg-production and hatchability.—N. J. Scorgie.

Almquist, H. J. (1938). **Influence of Bile Acids on Erosions of the Chick Gizzard Lining.**—*Science.* **87.** 538. 1 table. [5 refs.]

Chicks on a basal diet on which they were apt to suffer from erosion of the gizzard lining were not so affected if whole bile, cholic acid, deoxycholic acid, sodium glycocholate or sodium taurocholate were also included in the diet.

It is pointed out that gizzard erosion is a distinct entity from the vitamin K-deficiency syndrome which is characterized by delay in the coagulation of blood. —J. E.

PUBLIC HEALTH

—. (1936). **Work on the Examination of Milk by the London County Council in 1935.**—*Rep. Lond. County Counc., 1935.* **3.** Part 1. 42-43 and 69-70. 3 tables.

1,880 samples of liquid milk arriving in London were submitted to the biological test for tuberculosis during 1935, and of these 237 (12·6 %) were found to be infected. Details of milk inspection carried out in L.C.C. institution herds are given. Under the Milk and Dairies Order, 1936, 3,456 cows in 42 licensed cowsheds were examined, and TB. or some other defect was detected in 206 animals. Statistics are given in respect of chemical and bacteriological examinations carried out on milk supplied to schools and other institutions under the control of the L.C.C.—N. J. Scorgie.

Stebbins, E. L., Ingraham, H. S., & Reed, Elizabeth A. (1937). **Milk-Borne Streptococcic Infections.**—*Amer. J. publ. Hlth.* **27.** 1259-1266. 1 fig., 8 tables. [2 refs.]

Seven milk-borne streptococcus epidemics during 1934-1936 (comprising 1,529 cases with 24 deaths) were studied. Three were classified as scarlet fever (806 cases with six deaths) and four as septic throat. All were of the explosive type and occurred in villages supplied with raw milk. Pasteurization or suppression of the supply caused a marked decline in the number of cases. As usual more cases occurred in adults.

The appearance of a rash was the only distinguishable difference in the two types of cases. Previous attacks of scarlet fever gave little or no immunity to either type, but apparently reduced the incidence of the rash. The source of infection in six of the outbreaks was, in each case, a cow suffering from acute mastitis caused by a group A haemolytic streptococcus.—H. E. Bywater.

Shaughnessy, H. J., & Grubb, T. C. (1936). **Staphylococcus Food Poisoning. Report of a Small Milk-Borne Epidemic.**—*J. infect. Dis.* **58.** 318-323. [12 refs.]

A farmer and his family suffered from several attacks of gastro-enteritis and, later, ice-cream made from raw milk supplied by the farmer caused an outbreak involving 25 persons. Milk from a quarter from each of three apparently healthy cows on the farm proved positive to the bromthymol blue test. 890-19,500 staphylococcus colonies per c.c. were obtained. A haemolytic staphylococcus of albus variety was isolated from the milk which, after cultivation, produced vomiting in monkeys and human beings. It is concluded that mastitis milk is more dangerous than is usually supposed.—H. E. Bywater.

Guittonneau, G. (1937). La problème actuel de la pasteurisation obligatoire des laits de consommation. Commentaires sur les études d'un centre de recherches improvisé. [**Obligatory Pasteurization of Milk**].—*Rev. Microbiol., Paris.* **3.** 317-342. 5 figs. [5 refs.]

The article deals with the study of the problem of pasteurization in the neighbourhood of Paris, where a large volume of milk is produced on individual, small farms. The milk was found highly contaminated with organisms, and up to 40% of samples were infected with tubercle bacilli. It is held that a milk low in saprophytic organisms is also likely to be low in pathogenic organisms. A suitable medium for plate-counts is described. Details are given of observations on thermal death points of organisms in the milk, and sources of contamination, both before and after pasteurization, are discussed.

It is suggested that if and when milk is produced hygienically, pasteurization will have only one function, *viz*, to retard souring of the milk, which function can equally well be accomplished by refrigeration.

Graphs are employed to show the rate of multiplication of organisms in milk at various temperatures both before and after pasteurization.—H. Burrow.

I. Staub, A. F. (1938). **Federal Meat Inspection in New York City.**—*J. Amer. vet. med. Ass.* **92.** 760-762.

II. Faulder, E. T. (1938). **State Meat Inspection Service in New York State.**—*Ibid.* 763-765.

III. Curley, E. M. (1938). **The Inspection of Food for Army Requirements.**—*Ibid.* 765-768.

IV. Regan, J. J. (1938). **Veterinary Supervision of Milk Supplies in the New York Milk-Shed.**—*Ibid.* 769-771.

V. Schoneweg, F. W., & Danziger, M. (1938). **Veterinary Service in New York City Pertaining to the Protection of Public Health.**—*Ibid.* 771-773.

I. Scattered throughout New York City and the Metropolis are 89 meat establishments under veterinary inspection by officers of the Bureau of Animal Industry. The duties include the complete supervision of all stages in the preparation of food products, inspection of foreign meat at the ports, and the inspection and selection, according to grades, of meat and some other foods intended for government services. In New York four million animals, 220 million pounds of food products, 90 million pounds of foreign meat and 14 million pounds of foreign sausage skins were inspected. Thirteen million pounds of meat and 9,500,000 pounds of inedible by-products were also certified for exportation. 1,300,000 animals were inspected in the public stockyards. There are, in New York, 32 veterinarians and 104 other federal employees engaged on this work.

II. The Federal Meat Inspection Act of 1906 requires meat intended for inter-state trade to be inspected by the federal services.

All *ante-* and *post-mortem* inspections are carried out by veterinarians selected as a result of Civil Service examination. The law requires inspection from " hoof to can " and establishments are under supervision day and night. Two thirds of the animals slaughtered in the United States are inspected by the federal service ; but the remaining one third is often inadequately controlled and, in many cases, is not inspected. In New York State there are at least 280 abattoirs without adequate inspection. There are only 15 veterinarians employed either wholly or partially on local meat inspection under New York State control. Suggestions are made for improving the position.

III. The inspection of meat, poultry, fish and dairy products for the army has been undertaken by the officers of the United States Army Veterinary Corps since the Spanish-American war. Meat foods are only accepted from works supervised by the Bureau of Animal Industry. Both the soundness and the grades of foods, according to specification, are checked. Dairy herds and milk plants are inspected.

IV. Veterinary supervision was inaugurated in 1893 by a large milk company employing a whole-time veterinary surgeon to examine dairy cattle and to ensure hygienic production of milk. This led to the formation of a staff of veterinarians with complete control of production. A similar procedure began about 1906 in the Department of Health, and in 1912 an annual examination of all cows was adopted, which has been followed by other municipalities and states. Formerly the clinical work was mainly concerned with tuberculosis, but now mastitis is the chief item. Practically every veterinary surgeon in the area takes part in the work, whilst over 100 veterinarians are employed whole-time by the milk companies and large producers. The work extends to the entire field of milk sanitation, and many veterinarians hold executive positions in all phases of the milk industry.

V. Twenty veterinarians are employed in bureaux of the Department of Health. One is acting Assistant Director, Bureau of Food and Drugs, whilst seven are employed in inspecting meat and poultry and two in connexion with milk and milk products. Sanitary conditions in food factories are supervised and there is check inspection at abattoirs, where the meat is examined by federal veterinarians.

Nine are employed in the veterinary division of the Bureau of Preventable Diseases. There the great problem is rabies. In 1937, 25 thousand persons were

reported to have been bitten by dogs, 75 by 68 dogs proved rabid. During the last eight years, of 465 persons bitten by known rabid dogs, only four developed rabies.

A veterinarian is also in charge of horses and calves in the Bureau of Laboratories.—H. E. Bywater.

Csiszár, V. (1937). A debreceni közvágóhídon 1934-36. években végzett bakteriologiai husvizsgálat eredményéről, különös tekintettel a lóban talált Bac. enteritidis Breslau-fertőzésre, sertések lépenéjére és a húsban talált saprophyták gyakorlati jelentőségére. [**Report on Bacteriological Meat Inspection at Debrecen Abattoir, Hungary, 1934-1936**].—*Állatorv. Lapok.* **60.** 303-308. 1 table.

Between 1934 and 1936 the following numbers of animals passing through Debrecen abattoir were inspected bacteriologically :– 24 out of 463 horses ; 145 out of 19,196 cattle ; 28 out of 25,156 young calves ; 12 out of 8,987 sheep and goats, and 172 out of 124,398 pigs. 72·5% of all carcasses detained for bacteriological examination were later released for human consumption. Anthrax was detected ten times ; swine erysipelas, 15 times ; *Salmonella cholerae-suis*, twice, and *S. typhi-murium*, once (in a horse).—G. Sályi (Budapest).

Névot, A. (1937). A propos des principaux motifs de saisie en inspection des viandes. [**Principal Grounds for Condemning Meat at Meat Inspection**].—*Thesis, Alfort.* pp. 91. 7 tables. [Numerous refs.]

N. discusses the grounds for condemnation of meat in the case of tuberculosis, oedema and infiltration, infectious arthritis of calves and putrefaction. He thinks there is a tendency in France to make too limited seizure where TB. is localized to a lymph node.—N. J. Scorgie.

Monoury, G. (1938). Inspection des viandes et spondylite porcine. Recherches expérimentales. [**Spondylitis in Swine and Meat Inspection**].—*Thesis, Alfort.* pp. 59. [Numerous refs.]

The necessity for a careful examination of the vertebral column of swine in meat inspection is stressed. Abscesses in this region are usually of tuberculous origin ; no abscesses due to *Brucella abortus* have been noted in this situation in France. An account of lesions observed in a number of tuberculous porcine carcasses is given.—N. J. Scorgie.

I. Maitrot, P. (1937). Les oeufs. Salubrité, inspection. [**Hygiene and Inspection of Eggs**].—*Thesis, Alfort.* pp. 86. 5 tables, 3 graphs. [Num. refs.]

II. Tcherkess, K. (1937). Inspection, production et commerce des oeufs en Syrie. [**Inspection, Production and Sale of Eggs in Syria**].—*Thesis, Alfort.* pp. 112. 4 figs. [Numerous refs.]

I. An account of the various ways in which eggs may be damaged and rendered unfit for human consumption. Published work dealing with bacterial infections of eggs is summarized. During the years 1922-1935 the annual percentage of eggs rejected at inspection in the Halles Centrales, Paris, varied between 2·27 and 3·19.

II. A review of the poultry industry in Syria. Poultry husbandry is still practised on rather primitive lines, and T. makes several suggestions as to how improvement could be effected.—N. J. Scorgie.

THERAPEUTICS

GUERRET, M. (1937). Chimiotherapie de la gourme. [**Chemotherapy of Strangles**]. —*Thesis, Alfort.* pp. 54. [Numerous refs.]

G. gives quotations from the literature and discusses the indications for the use of the following drugs for the symptomatic treatment of strangles :– colloidal silver, H_2O_2, phenol, formalin, uroformine, KI, alcohol, camphor in alcohol, arsenicals and acridine compounds. He mentions tests which are being carried out in France on rubiazol [red prontosil] and finally gives 11 case records of strangles in horses which he treated with " soluseptazine " [disodium p (γ-phenyl-prophyl-amino) benzene-sulphonamide-a-γ disulphonate]. An average of six daily injections each of 3 g. in 15 c.c. of water was given, the first two intravenously and the rest subcutaneously. All cases are said to have recovered, but there were no controls.—J. E.

SCHUBERT, F. (1938). Versuche zur Bekämpfung der Fohlenlähme mit intravenösen Trypaflavininjektionen. [**Control of Navel-Ill by Intravenous Injections of Trypaflavine**].—*Wien. tierärztl. Mschr.* **25.** 133-143. [3 refs.]

An account of the treatment of joint-ill in 35 foals by intravenous injections of trypaflavine (0·4-0·8 g. in 1% solution). 28 recoveries were said to be obtained. [The precise infection involved in each case was not determined].—F. F. (HAMBURG).

MONTGOMERIE, R. F. (1938). **Sulphanilamide in *Br. abortus* Infection in Animals.** —*Vet. Rec.* **50.** 380-382. [2 refs.]

M. inoculated eight g. pigs and two goats with *Br. abortus*. The g. pigs were divided into two groups, one of which was treated, while the other was used as a control. The treatment consisted of 12 doses, 200 mg. on each of the first six days, and 100 mg. on each of the second six.

P.M. examination of the controls revealed enlargement of the spleen, and plates inoculated with suspension of spleen substance gave abundant growth. The treated animals appeared normal, and material from three of the four gave no growth on the plates ; the growth obtained from the fourth was scanty.

Of the two goats used, one previous to treatment showed a milk plate count of 100,000 *Br.a.* per c.c. This animal was given six daily doses of 10 g. of sulphanilamide, and the milk was plated from the third day of treatment for 17 days. *Br.a.* was isolated on two occasions : on the first day of plating a count of one per c.c. was obtained, and three days later a count of three per c.c. Fourteen days after cessation of treatment, an unsuccessful attempt was made to reinfect the udder.

The results in the other goat were inconclusive.—W. J. IRONSIDE.

DICKERSON, Virginia C., & WHITNEY, L. F. (1938). **Sulfanilamide and Prontosil in the Treatment of Canine Distemper.**—*Proc. Soc. exp. Biol., N.Y.* **38.** 263-264. [6 refs.]

Trials were carried out on 29 dogs in kennels in which the first case of distemper had been observed six days previously, the animals being in various stages of the disease.

Some were treated with prontosil by subcutaneous injection in doses of 50 mg. per kg., some with sulphanilamide *per os*, in doses of 33 mg. per kg., some received both drugs, and the remainder were left untreated.

No evidence was obtained that the drugs either singly or in combination produced any beneficial effect.—W. J. IRONSIDE.

GROULADE. (1937). Les colorants azoïques dans le traitement de la maladie de Carré. [**Treatment of Canine Distemper with Azo Dyes**].—*Bull. Acad. vét. Fr.* **10.** 345-347.

The records of six cases of distemper successfully treated with rubiazol (hydrochloride of chrysoïdine sulphonamide) are reported. An intravenous injection of 5-10 c.c. of a 0·5% solution was administered during the early stages of the infection, and this was usually followed by 1 g. given daily *per os* until the temperature became normal.—H. V. HUGHES.

v. SARNOWSKI. (1937). Die arzneiliche Behandlung der Wurmbefalls der Pferde, insbesondere der Strongylose und Allegan-Tafeln. [**Drug Treatment of Equine Strongylosis**].—*Berl. tierärztl. Wschr.* Sept. 17th. 577-580 and Sept. 24th. 593-596. 10 tables. [7 refs.]

An article describing a proprietary arsenic preparation called " Equivermon " and another called "Allegan ", a derivative of arsenilic acid. The author has used them with success to control strongylosis in horses and foals in breeding studs. —F. FREUDENBERG (HAMBURG).

HEDSTRÖM, H., & OLSON, A. (1938). Desinfektionsförsök med natriumortofenylfenolat. [**Disinfection Trials on Tubercle Bacilli with Sodium Orthophenylphenol**].—*Svensk VetTidskr.* **43.** 55-58. [1 ref.]

The disinfectant action of " Disinfectant B.T.D." (sodium orthophenylphenol) on tubercle bacilli, first experimented on by American workers, was retested by the authors. In three inoculation experiments on g. pigs with treated and untreated materials containing living tubercle bacilli, it was found to be completely effective in a 1% solution after an interval of ten minutes, and in a 2% solution after two minutes.—GUSTAV NAERLAND (OSLO).

KWIATKOWSKA, J. (1938). Dzialanie bakteriobòjcze krezoformu klawe w porownaniu do karbolu i innych srodkow odkazajacych. [**Tests of Various Disinfectants**].—*Przegl. wet.* **53.** 280-298. 8 tables. [12 refs.] [German summary].

K. discusses the relative bactericidal power of various disinfectants as used in Poland :– phenol, creolin, lysol, and " cresoform " were studied in relation to *Brucella abortus*, *Pasteurella aviseptica*, *Past. suiseptica*, *Streptococcus equi*, *Erysipelothrix rhusiopathiae*, *Salmonella paratyphi B* and *Bacterium coli*.

Results are given in six tables showing the different concentrations and the length of time required for their action ; a résumé of the whole is given in a final table.

The minimum concentrations required to kill all the above organisms except *Bacterium coli* within 15 minutes were :– 0·1% of " cresoform ", 0·5% of creolin, 0·5% of lysol and 2% of phenol.

POWELL, H. M., & JAMIESON, W. A. (1937). **Maintenance of Antiseptic Action by " Merthiolate " as a Preservative.**—*Proc. Ind. Acad. Sci.* **46.** 66-70. 3 tables. [7 refs.]

Merthiolate (sodium ethyl mercuri-thiosalicylate), obtained from commercial vaccines which had been preserved with it, was found to have retained substantially full antiseptic powers for three years, and had a certain degree of action even after seven years.—A. ROBERTSON.

Gonneaud, P. (1936). Contribution à l'étude des pectines et de leur emploi dans la pratique vétérinaire. [**Use of Pectins in Veterinary Medicine**].—*Thesis, Alfort.* pp. 65. 1 table. [Numerous refs.]

G. recommends the use of a solution of pectin (arhémapectine) plus traces of calcium salts as a haemostatic. Such a solution, when rendered isotonic and sterilized, was injected (intraven.) into several horses, and reduced the average clotting time of the blood from about 19 minutes to four minutes. The doses recommended are :– for the horse and cow, 80 c.c. (intraven.); for large dogs, 20 c.c. (intraven.), and for small dogs and cats, 20 c.c. (subcut.).

G. quotes its use in several clinical cases, including epistaxis, haematuria, external haemorrhage, both accidental and post-operative, and also of haemorrhage in the uterine stump after hysterectomy and of uterine *post-partum* haemorrhage in a cow. Good results are claimed.—A. Robertson.

Toureaux, J. L. C. (1937). Les injections intra-veineuses de carbone colloïdal en médecine vétérinaire. [**Intravenous Injections of Colloidal Carbon in Veterinary Medicine**].—*Thesis, Alfort.* pp. 77. [Numerous refs.]

A record of the use of intravenous injections of colloidal carbon in various conditions, chiefly pneumonia, mastitis and metritis. The results obtained are considered encouraging [see also *V. B.* **8.** 658].—A. Robertson.

Jørgensen, J. V. (1938). Études sur l'action de l'hydroxyde d'aluminium sur l'organisme. [**The Action of Aluminium Hydroxide on the Body**].—*Acta path. microbiol. scand.* **15.** 1-15. 6 figs. [In French].

Subcutaneous injection of aluminium hydroxide into g. pigs causes an inflammatory reaction of short duration during which the particles become surrounded by polynuclear leucocytes. A mesenchymatous reaction follows with a mobilization of phagocytes which synthesize a structure resembling a resorptive tumour; the latter may persist for several months, but has no proper fibrous capsule. The injection is followed by a non-specific leucocytosis, rapidly falling to normal to be followed by a secondary leucocytosis lasting four days. In some animals it was possible to demonstrate small quantities of the hydroxide in the lungs and the circulating blood cells.—Alfred Eden.

POISONS AND POISONING

Harms, F. (1937). Kalkstickstoff vergiftungen bei Tieren. [**Calcium Cyanamide Poisoning of Domestic Animals**].—*Dtsch. tierärztl. Wschr.* **45.** 625-628. 3 tables. [5 refs.]

Poultry, rabbits and g. pigs do not readily eat food with which calcium cyanamide has been mixed. As very large amounts (6 g. per kg. body weight) are necessary to cause death it is thought that this substance rarely causes losses. —P. S. Watts.

Prell, H. (1937). Die Schädigung der Tierwelt durch die Fernwirkungen der Indüstrie (abgasen). [**Injuries to Animals by Industrial Waste Gases**].—*Arch. Gewerbepath. Gewerbehyg.* **7.** 656-670. [2 refs.]

A description of a disease in wild game animals and bees in the neighbourhood of a large foundry in Saxony. It was estimated that 50 kg. of arsenious acid was emitted in the smoke e very day despite the use of an electrical cleanser.

Finely divided arsenic was deposited on plants and often penetrated into the flowers so that both animals and bees were poisoned. The animal most affected was the roe deer; red deer were less frequently affected and hares very seldom became affected. The symptoms included dermatitis, loss of hair, inflammation of the mucous membranes and of the digestive system, swelling of the spleen and liver, cirrhosis of the liver, oedema of the connective tissue, swelling of joints, abnormalities in the antlers and general loss of condition. Losses amongst worker bees were very great.—F. Freudenberg (Hamburg).

Hasskó, A. (1938). Phosgenvergiftung beim Pferd. [**Phosgene Poisoning in the Horse and Fowl**].—*Tierärztl. Rdsch.* **44.** 140-141. 3 figs.

A horse was placed for ten minutes in a closed room containing air contaminated with phosgene and chlorine (135 and 15 mg. per c.m. respectively). Only after 23 minutes in the open air did it begin to show signs of poisoning. It then began to sweat and show dyspnoea and 47 minutes after release from the gas-filled room had a pulse rate of 97 and a respiration rate of 23 per minute. The head was lowered and the neck stretched out. A haemorrhagic nasal discharge began 72 minutes after cessation of exposure and death from suffocation took place before the end of the second hour. Both venesection and calcium chloride injections were used in an endeavour to cure.

Hens died fairly quickly after being exposed to phosgene (20 mg. per c.m. of air) for five minutes. They are, therefore, of potential value as indicators of the presence of phosgene.—J. E.

Carpenter, P. T. (1938). **Acute Senecio Poisoning.**—*Vet. Bull. U.S. Army.* **32.** 33-41. 3 figs.

In three foals and one filly grazing on pastures in which *S. Riddellii* was present, symptoms of poisoning were shown by an elevated temperature, accelerated pulse, depression, muscular inco-ordination, accompanied by periods of coma, and usually a foetid diarrhoea. Treatment consisted of ice packs applied to the poll, intravenous injection of neoarsphenamine (to lower the temperature) and administration of liquid paraffin. One animal succumbed, showing on P.M. examination haemorrhagic areas in the lungs, liver, spleen, and kidneys and on the pleura and peritoneum as well as deeply yellow-coloured mucous membranes and internal fat. The drinking water and " loco weed " were experimentally negatived as causative agents, but infusions of *S.R.* given orally to horses induced similar clinical symptoms and lesions. In all cases examination for the virus of encephalomyelitis which causes similar clinical symptoms proved negative.—Alfred Eden.

Dobrijnina, V. (1937). Jadovitye svoĭstva gorčaka. [**Poisonous Properties of *Centaurea***].—*Sovyet. Vet.* No. 9. pp. 34-36.

It was noticed that horses are sometimes poisoned by ingesting *C. repens*. In order to study the toxicity of this plant, found mainly in Central Asia, experiments were carried out on rabbits and cats. Results showed that the intravenous injection of 1 c.c. of a 10% infusion of *Centaurea* increased the pulse and respiration rate.

Daily doses first of 15 c.c., and later of 20 c.c. of the same infusion, given to rabbits, caused after some time a complex chronic poisoning of the central nervous system. The respiration rate reached 306 a minute and the pulse 275. Blood pressure decreased. The tone of the isolated intestine of a cat was at first depressed, and then abnormally excited. It was shown that *Centaurea* contains alkaloids.

Bobašinskii, A. I. (1937). Otravlenie lošadeĭ kirkazonom. [**Poisoning of Horses with *Aristoluchia clematidis***].—*Sovyet. Vet.* No. 9. pp. 36-38.

This is a record of 18 horses poisoned by eating the leaves and seeds of *A.c.* Symptoms included loss of appetite, constipation, mydriasis, yellowing of the mucous membranes, increased pulse rate, sleepiness, staggering gait and sometimes posterior paralysis. A crisis occurred between the sixth and tenth days of illness; horses surviving this crisis slowly improved, although remaining weak and thin. The illness lasted 6-30 days. Eight of the diseased horses died and P.M. examination showed severe gastro-enteritis and degeneration of the heart, liver and kidneys.

Experiments were carried out by the authors on laboratory animals to determine the relative toxicity of the different parts of the plant. Results given in tabular form show that the most toxic parts are the leaves; the seeds come next and the stem third. It was also shown that the plants of *A.c.* are more toxic before flowering than when the seeds are fully grown.

Anon. (1937). Venins. [**Research on Snake, Bee and Spider Venoms**].—*Bull. Inst. Pasteur.* **35.** 1175-1200.

This number of the above periodical contains a large collection of abstracts, extending over 25 pages, on animal poisons. They are of a biological and medical nature, and do not refer directly to snake bite in animals, though they are of indirect veterinary interest.—J. E.

PHYSIOLOGY

Mongiardino, T. (1937). Osservazioni sulle formazioni fibrillari dell'epidermide ungueale dell'equus caballus. [**The Structure of the Hoof of the Horse**]. —*Profilassi.* **10.** 129-136. 7 figs. [Numerous refs.] [English, French and German summaries]. [See also *V. B.* **8.** 254].

M. has studied the histological structure of the cutis of the feet of young horses and gives a detailed account of the deep layers of the hoof horn which join the matrix. Important cells of this part are tonofibrils, which are extraordinarily developed and numerous, their function being to strengthen the whole hoof structure and thus enable it to resist the pressure on the frog during motion. The tonofibrils are supported by cell bridges which serve to transmit stimuli mechanically from cell to cell. M. thinks that the latter are formed by ectoderm, and the tonofibrils by endoderm, and illustrates his arguments by photomicrography. —S. F. J. Hodgman.

Éloy, J. (1937). La barrière hémato-encéphalique. Influence de l'uroformine. [**The Blood-Brain Barrier and the Influence on it of Uroformine**].—*Thesis, Alfort.* pp. 116. 1 fig. on 1 plate, 2 tables. [Numerous refs.]

Intravenous injections of uroformine even in very large doses did not permit haemolysins administered intravenously to penetrate the blood-brain barrier into the cerebro-spinal fluid.—A. Robertson.

Mühlbock, O. (1937). Ueber die oestrogenen Stoffe und den Cholesteringehalt im Serum trächtiger Stuten. [**Oestrogens and Cholesterin Content of Pregnant Mares' Serum**].—*Hoppe-Seyl. Z.* **250.** 139-146. 3 tables. [10 refs.]

The serum of ten pregnant mares was examined, and was found to

contain 2,500-10,000 international units of " oestrogenic substances " per litre between the sixth and ninth month. The amount fell considerably in the last two months. The cholesterin content of blood serum was found to be somewhat greater in pregnant than in non-pregnant mares (an average of 1 g. per litre as compared with 0·77 g.) Technical methods are given.—J. E.

ZEICH, W. (1937). Untersuchungen über den Säuregradfrischermolkener Kuhmilch unter besondere Berücksichtigung der Milch von euterkranken, brünstigen, stiersüchtigen und tuberkulösen Kühen und solchen mit Erkrankungen von Gebärmutter und Scheide. [**The Hydrogen-Ion Concentration of Fresh Cows' Milk**].—*Inaug. Diss., Giessen.* pp. 58. 14 tables. [Numerous refs.]

The pH of normal cows' milk is very constant, lying between 6·8 and 7·0. The pH of colostrum is somewhat lower, especially during the first few days after calving ; values as low as 6·1 have been obtained. Similarly during oestrus there appears to be a uniform reduction of pH to about 6·6. Milk from cows with streptococcal mastitis has a pH of about 6·0, and in chronic cases the pH may drop to about 5·2. Diseases of the ovaries, uterus or vagina do not necessarily cause the pH of the milk to be abnormal. In cases of TB. of the udder the pH is usually increased to about 7·4.—J. A. NICHOLSON.

KON, S. K. (1937). **The Effect of Heat on the Nutritive Value of Milk.**—*Agric. Progr.* **14.** 156-158. [7 refs.]

Comparison was made between raw milk and milk pasteurized by the " holder " method in respect of constituents previously reported to be heat-labile or affected by pasteurization. The experimental animals employed were rats, with litter mates as controls. Pasteurization had no adverse effect upon the following properties of milk :– proteins in respect of digestibility and biological values ; vitamin A and carotene ; the availability of the Ca and P present, and total nutritive value as measured by growth rate and composition of the carcasses. For milk as a source of the vitamin B complex, there was no appreciable difference in growth rate of females fed on raw and pasteurized milk, but males were definitely heavier when fed on raw milk. On an average, 20% of the vitamin C content of raw milk is destroyed in pasteurization. Generally these experiments failed to disclose any appreciable loss in the food value of milk attributable to pasteurization by the " holder " method.—ALFRED EDEN.

MANGOLD, E., & DAMKÖHLER, H. (1938). Versuche über Wachstum und Futterverwertung bei der Kükenaufzucht mit und ohne Grit. [**Growth and Digestion Efficiency in Chickens Raised with and without Access to Grit**]. —*Arch. Geflügelk.* **12.** 20-36. 5 tables. [9 refs.] [English summary].

Leghorn chickens were reared to laying age, some being given grit and some no grit, and all being fed for successive periods on a cereal mixture followed by wheat, barley and oats.

The results are considered to indicate that there was no advantage to be obtained from feeding grit to fowls.—SASSENHOFF (MUNICH).

SHIMER, S. R. (1937). **Chemical Studies on Chicken Blood.**—*Bull. Univ. N. H. agric. Exp. Sta.* No. 69. pp. 16. 6 tables. [Numerous refs.]

The following chemical constituents were analysed in the blood of 130 birds :– non-protein nitrogen, urea, urid acid, total creatinine, preformed creatinine,

inorganic phosphorus, calcium, chlorides, glucose, alkali reserve, and pH. Not all these constituents were estimated in each bird.

The results are in substantial agreement with those previously reported. It is not possible to lay down well defined limits as the normal variations of these substances are considerable, average figures being particularly misleading. The following must influence such values :– moulting, state of egg production, type of diet, time of last feed and the cyclic action of the liver. There appears to be no significant difference in these values between different breeds of fowls.—D. L. H.

Deobald, H. J., Christiansen, J. B., Hart, E. B., & Halpin, J. G. (1938). **The Effect of Partial or Total Oviduct Removal on the Calcium Content of the Blood of Pullets.**—*Poult. Sci.* **17.** 94-96. 1 chart. [2 refs.]

In order to determine whether the oviducts or shell glands have any control over the blood calcium in the hen, the operation of partial or complete removal of the oviduct was performed on 20 White Leghorn pullets 6-8 weeks old ; 15 birds survived the operation and were reared normally with five control birds. The birds were bled twice a week as maturity approached and the blood calcium was estimated. The results showed no significant differences between the treated and control birds either by the blood calcium curves or by external appearances. No differences were seen between those birds in which the whole oviduct was removed or those in which the shell glands were left partially or wholly intact. —A. T. Phillipson.

Penjonschkewitsch, E. E. (1937). Material zum Studium pathologischer Vorgänge bei der embryonalen Entwicklung des Kükens während der künstlichen Bebrütung. III. Ueber die Gasdurchlässigkeit der inneren Schalenhaut. [**The Study of Pathological Processes during the Embryonic Development of Chicks in Incubators. III. Gas Permeability of the Inner Shell Membrane**].—*Arch. Geflügelk.* **11.** 1-19. 1 fig., 4 tables. [7 refs.] [English summary].

[Parts I & II were articles in Russian by Ferdinandov (1929 and 1931) on the technique of egg incubation].

P. carried out experiments to test the effect on the egg membrane of lack of moisture in egg incubators and to find whether as a result the membrane loses its permeability to gases, with the consequent death of the chicks. It was found that during the course of the incubation in these conditions the water content of the egg membrane increased and the gas permeability decreased. When the atmospheric humidity was high and the temperature normal the gas permeability of the membrane was greatest, whilst it was lowest at a high atmospheric temperature with normal humidity. Permeability also depended on the condition of the embryo. It was greater in eggs containing live embryos than in eggs containing dead embryos, although the membranes of 6% of a number of fresh eggs containing live embryos were non-permeable to gases on examination.—Sassenhoff (Munich).

TECHNIQUE AND APPARATUS

Plummer, P. J. G. (1938). **Photometer for Standardizing Bacterial Antigens.** —*Canad. J. comp. Med.* **2.** 24-28. 2 figs.

P. describes a method of overcoming the variations due to personal error which are encountered when bacterial antigens are standardized by the degree of their opalescence. He gives diagrams and detailed instructions concerning the

construction, light source, fluid receptacles and electrical circuits of the photometer. Adequate explanation is offered regarding adjustment and operation; finally the precautions to be observed in order to obtain best results are mentioned.
—Chas A. Mitchell.

MISCELLANEOUS

Pannisset, M. (1937). Le nouveau service vétérinaire de la Province de Québec. [**New Veterinary Service for the Province of Quebec**].—*Canad. J. comp. Med.* **1.** No. 3. 17-21. [In French].

Important changes have been made in the organization of the veterinary service in the province of Quebec. Administration of the veterinary personnel has been taken out of the hands of non-veterinarians and put under veterinary supervision. A consulting committee, consisting of practitioners and representatives of agricultural schools and of l'École vétérinaire has been formed. Application of the Animal Contagious Diseases Act and the Meat and Canned Foods Act will be left to the federal authorities; the provincial authorities will work on and attempt to control such diseases as epizootic abortion, mastitis, equine infectious anaemia, etc., and will also act as educators for the farming public in promoting better livestock conditions.—L. B.

Jordanoff, P., & Kester, O. (1937). Organizacija kurativnog djelovanja Bugarskog veterinara. [**Organization of the Bulgarian Veterinary Service**].—*Jugoslov. vet. Glasn.* **17.** 324-327.

A detailed description of the organization of veterinary work in Bulgaria, where the whole veterinary profession is under state control and hardly any private practice exists. The work is organized under four chief inspectors, concerned with epizootics, public health, tuberculosis and clinical work respectively.

A historical account of veterinary work from about 1890 up to the present day is given [see also *V. B.* **2.** 362, **4.** 786, and **6.** 772 and 841].
—B. Oswald (Križevci).

REPORTS

Extracts from Annual Reports of Agricultural Experiment Stations U.S.A. [The matter given here is a bare outline of the work done. When papers by the staffs of these stations are published abstracts are prepared from them and included in the *Veterinary Bulletin* as a matter of routine].

Colorado, 1936-37. A problem for future research is the poisoning of livestock by oats and barley hay. Work was done on poisoning by sorghum and sudan grass, Bovine Brucellosis, urinary calculi in cattle and sheep, Enterotoxaemia and Soremouth in sheep, and helminth parasites of sheep.

Delaware, 1936-37. Some proprietary fly repellents were tested on horses, with poor results.

Hawaii, 1936. The liver fluke situation is described; nearly half of all slaughter cattle are affected. Notes are also given on research into new intermediate hosts of the following poultry parasites:—*Hymenolepis exigua*, *Dispharynx spiralis*, *Tetrameres americana*, *Oxyspirura mansoni* and *Cheilospirura hamulosa*. Parasites of horses, swine and fowls are also mentioned.

Montana, 1935-36. Cultures of *Fusiformis necrophorus* grown in ordinary media and placed in soil were found to be capable of surviving for three years. An alum-precipitated toxoid for immunizing sheep against Black Disease was successful experimentally, and was issued for field use. Coccidia were found

commonly in healthy cattle and *per se* are not considered to be dangerous. On chemical analysis the lungs of sheep with CHRONIC PNEUMONIA (" lungers ") that occurs in the State were found to contain twice as much silica as normal lungs.

NEVADA, 1935-36. A description is given of a new building placed at the disposal of the veterinary department.

NEW YORK, 1936-37. Work was done on the prevention of MASTITIS, the maintenance of mastitis-free herds, and the effect of MASTITIS on milk production and on milk control problems in relation to hygiene.

PUERTO RICO, 1936. An account is given of the important helminth parasites of livestock.

WYOMING, 1936-37. It was found possible to check winter outbreaks of FOWL CORYZA by infecting birds in summer, when they are resistant. Attempts to vaccinate lambs against SOREMOUTH were unsuccessful. The causes of stiff lambs appeared to be diverse, navel infection and nutrition being involved. Tests on cylindrical and flat roosting posts for turkeys showed that no particular type specially favoured the development of crooked sternum in young birds. A résumé of recent advances in the knowledge of selenium is given. Notes are given on poisoning of cattle by the ground lichen (*Parmelia molluiscula*), and by arrow grass (*Triglochin maritima*).—J. E.

CZECHOSLOVAKIA. (1937). Zpráva o veterinární službě v republice československé za léta 1932 až 1934. [**Report of the Veterinary Service, 1932-1934**]. pp. 144. 34 tables, 14 diagrams. Prague : Imprimerie d'État. [4to].

The report includes statistical data regarding the veterinary service, veterinary institutes, laws, and the breeding and diseases of domestic animals.

STAFF.—The total number of veterinarians in Czechoslovakia was 1,333 and comprised 262 state veterinarians, 359 city veterinarians, 147 district veterinarians and 565 private practitioners.

ANIMAL CENSUS.—There were 701,081 horses, 4,304,529 cattle, 3,031,846 swine, 957,111 goats and 510,101 sheep in Czechoslovakia.

ANIMAL DISEASES.—The number of outbreaks of ANTHRAX diminished in comparison with previous years. Compensation paid in connexion with slaughtered animals was 367,020 Kč. Protective inoculation was carried out with success on 235,000 cattle and sheep. The total average number of cases of BOVINE TUBERCULOSIS found P.M. in abattoirs was 2·65 %. The extent of tuberculin testing increases each year. SWINE ERYSIPELAS decreased as a result of protective inoculation carried out on a large scale. Total losses numbered 2,938 pigs. Compensation, financed from an insurance fund contributed to by farmers on a *per capita* basis of pigs immunized, was paid for slaughtered animals. Fifty-three horses with GLANDERS were slaughtered. Contacts are tested with mallein, reactors are slaughtered and compensation is paid.

FOOT AND MOUTH DISEASE occurred in several districts. The course of infection was mild, total losses numbering 1,039 cattle and pigs. Vaccination, inoculation of convalescent serum and symptomatic therapy were used. There were intensive outbreaks of SWINE FEVER, with considerable losses. The infection was contracted from imported pigs. Control consisted of inoculation with serum and formolized vaccine, border control, and tracing of contacts. There were fewer cases of RABIES. The disease occurred in 845 dogs and 101 cats and other animals. Emphasis is laid on the value of protective inoculation of dogs.

Other diseases of domestic animals, such as EQUINE INFECTIOUS ANAEMIA, MANGE in horses and sheep, *Brucella abortus* infection, OSTEOMALACIA, etc., occurred sporadically. There were no cases of DOURINE, RINDERPEST, or CONTAGIOUS BOVINE PLEURO-PNEUMONIA.—E. PŘIBYL (BRNO).

HUNGARY. (1937). A m. kir. Országos Állatagészségügyi Intézet működése az 1936. évben. **[The Work of the National Animal Health Institute, Budapest, in the Year 1936].** [MANNINGER, R.]—*Állatorv. Lapok.* **60.** 276-281. 3 tables.

This report gives the statistics concerning diagnostic examinations of carcasses, animal organs and blood samples, results being tabulated according to species of animal and to disease. 267 samples of vaccines and antisera were also tested for state control purposes, and milk samples were examined. 389 out of 2,572 bovine blood samples, and 1,886 out of 10,631 porcine blood samples, were positive for brucellosis; 2,210 out of 85,954 fowl blood samples were positive for salmonella infection. Tubercle bacilli were present in 15 out of 188 milk samples.

—G. SÁLYI (BUDAPEST).

YUGOSLAVIA. (1937). Deset godina veterinarskog laboratorijskog, epizootiološkog i higijenskog rada u Južnoj Srbiji. **[Ten Years' Work at the Veterinary Department of the Institute of Hygiene for Southern Serbia].** [MLINAC, F.]—*Jugoslov. vet. Glasn.* **17.** 399-408. 1 table, 1 photograph.

Infectious and parasitic livestock diseases are more prevalent in Southern Serbia than in other parts of the country. The most important diseases are anthrax, glanders, fowl cholera, anaerobic infections, piroplasmosis, avian spirochaetosis, foot and mouth disease, swine fever, sheep pox, rabies and mange. Recently, however, glanders, foot and mouth disease and sheep pox have decreased appreciably. Parasites are many and varied and require special study. Work is at present being carried out at the institute on braxy, piroplasmosis and tick paralysis. The staff of the institute also carry out field vaccinations, examine milk samples, and assist in the education of the public in matters of hygiene. The article concludes with a list of papers published by the staff during the period.

—B. OSWALD (KRIŽEVCI).

BOOK REVIEWS

MACKIE, T. J. [M.D., Professor of Bacteriology, University of Edinburgh; Honorary Bacteriologist to the Royal Infirmary, Edinburgh; Director of Bacteriological Services, City of Edinburgh Corporation], & MCCARTNEY, J. E. [M.D., D.Sc., Director of Research and Pathological Services, London County Council; formerly: Lecturer in Bacteriology, University of Edinburgh; Fellow of the Rockefeller Institute for Medical Research, New York]. (1938). **Handbook of Practical Bacteriology. A Guide to Bacteriological Laboratory Work.** pp. xi+586. Numerous tables, diagrams, 2 appendixes. [Numerous refs.] Edinburgh: E. & S. Livingstone. [5th Edit.] [8vo] [12s. 6d.]

This book has grown from an " Introduction to Practical Bacteriology " into a " Handbook of Practical Bacteriology " and this development is well justified, for there are few bacteriological laboratory procedures that are not amply described. The layout of the work has not been altered, Part I being an introduction, Part II dealing with " Bacteriological Technique ", and Part III with " Pathogenic Microorganisms and Bacteriological Diagnosis ". The text has been brought up to date in a number of ways.

A table of the antigenic structure of the salmonella group, a discussion of the *gravis*, *mitis*, and intermedius types of *C. diphtheriae*, and the differentiation of the brucella organisms, are among some of the necessary additions. The bacterial

nomenclature is rather conservative, for instance, there is a somewhat indiscriminate use of the term " bacillus ". However, this work is one that bacteriologists, whether employed in diagnosis or research, will frequently consult.—D. L. HUGHES.

BRADLEY, O. C. [M.D., D.Sc., F.R.C.V.S.] (1938). **The Structure of the Fowl.** pp. xi+139. 75 figs. Edinburgh and London: Oliver & Boyd. [2nd Edit.] [8vo] [7s. 6d.]

The second edition of this work is substantially the same as the first, except for some revision of the text. The illustrations are unchanged and have not been added to. The paper and setting out of the type are an improvement, and as a general guide to the anatomy and histology of the fowl the work will continue to be invaluable.—D. L. HUGHES.

REMLINGER, P. [Directeur de l'Institut Pasteur de Tanger], & BAILLY, J. [Chef de service à l'Institut Pasteur de Tanger]. (1938). Études sur la rage. [**Studies on Rabies**]. pp. 174. 1 photograph. [Numerous refs.] Paris: Masson et Cie. [8vo] [Fr.40].

During the period 1917-1937, at least 200 publications on rabies have been published from the Pasteur Institute, Tangiers, and it is the purpose of this monograph to list the various publications, and to summarize the results obtained in the course of this work.

These researches embrace such aspects as :– the presence of virus in the various body tissues; the unity of street virus and plurality of fixed virus; rabies in tropical countries; the behaviour of fixed virus during passage; the occurrence of paralysis during antirabic treatment; the immunization of animals by etherized and carbolized vaccines, and many other aspects, too numerous to mention.

At the end of the monograph, there is an appendix in which references are given to many publications on this subject from the Pasteur Institute, Constantinople, during the years 1903-1911.

Such a publication as this cannot fail to be of value; not only are interested readers able with a minimum of delay to refresh their memories on particular aspects of the subject, but it may also bring to notice publications which may have been overlooked.—GWILYM O. DAVIES.

SCHOOP, G. [Dr. Leiter des Staatlichen Veterinär-Untersuchungsamtes Kassel]. (1938). Krankheiten der Edelpelztiere und ihre Bekämpfung. [**Diseases of Fur Animals and their Control**]. pp. 193. 93 figs., 11 tables. [2 refs.] Hanover: M. & H. Schaper. [8vo] [RM.8].

This book is an indication of the rapid increase in importance of the fur animal industry, which has been in existence for little more than ten years in Germany. New knowledge on diseases of fur animals has not lagged behind, as the author shows in this treatise; moreover, veterinary students have been instructed in the subject for five years past at the Hanover veterinary college.

The animals dealt with include the silver, polar (blue and white) foxes, the mink, nutria and raccoon. The first 28 pages deal with the technique of handling fur animals and with general physiological data, and the other main sections deal with breeding defects, and losses which occur in new-born and immature animals, with non-infectious diseases, infectious diseases, parasitic diseases, hygiene and also the inspection of meat for the fur animals and also of their flesh which is permitted to be used as human and animal food.

The work seems to have been done very thoroughly, individual conditions dealt with being numerous and described in a practical manner. The book is a valuable and welcome addition to the literature.—J. E.

THAPAR, G. S. [M.Sc., Ph.D. (Lond.), Reader in Zoology at the University]. (1936). **Parasitic Worms and Disease: Lectures on Certain Aspects of Helminthology.** pp. 46. [Numerous refs.] Lucknow: Newul Kishore Press. [8vo].

This booklet comprises the text of three lectures on helminthology delivered by the author at Lucknow University with the object of stimulating the study of the subject in India.

The first lecture is a general introduction on historical lines and the other two deal with recent advances, all being comprehensive in scope and of interest to veterinary and medical workers as well as to laymen.—J. E.

HÜBNER, F. [Dr.] (1938). Die Magenwurmseuche des Rehwildes. Beobachtungen und Untersuchungen über ihre Bekämpfungsmöglichkeiten. Ausgeführt im Auftrage der Deutschen Jagerschäft im Jagdgau Ostpreussen. [**Stomach Worm Disease of Roe Deer**]. pp. 22. 6 figs., 2 tables. Berlin: Paul Parey. [8vo] [RM.1.20].

The report of an investigation into losses of roe deer in East Prussia. H. found that deaths were more numerous in deer living in low-lying districts and in relatively large herds, and that they mostly took place in the spring and autumn. P.M. examinations revealed heavy infestations with the stomach worm *Haemonchus contortus* and the intestinal worm *Chabertia ovina*, the latter being blamed for the actual illness and death.

It was observed that deer on land used for the rearing of pheasants were free from the disease: this was ascribed to the breaking of the life-cycle of the worms by the birds, which turned up larva-infested ground and caused larvae to perish from exposure—chiefly from drying. Control measures advised included the shooting of all weak deer and the limitation of their numbers, and winter feeding with roots, etc., to be put down at as many different places as possible.—J. E.

BENESCH, F. [Professor of Obstetrics and Director of the Obstetrical Clinic in the Veterinary High School, Vienna]. Edited by WRIGHT, J. G. [F.R.C.V.S., Professor of Surgery at the Royal Veterinary College, London]. (1938). **Veterinary Obstetrics (Equine and Bovine).** pp. ix+258. 135 figs. London: Baillière, Tindall & Cox. [8vo] [12s. 6d.]

This is an almost exact translation of the original German book, which was reviewed in *V. B.* **6.** 389. Professor WRIGHT has obviously spent much time on the selection of the technical terms in English and he has also inserted many helpful footnotes. The figures are identical with those of the original and an index has been made. The book is strongly recommended to veterinary students and practitioners.—J. E.

—. (1937). Festschrift Bernhard Nocht zum 80. Geburtstag (4. November 1937) von seinen Freunden und Schülern. [**Collection of Works in Honour of Professor Bernhard Nocht on his 80th Birthday**]. pp. x+704. Numerous text figures., figs. on plates, tables, graphs, 1 photograph, 1 map, numerous diagrams. [Numerous refs.] [In English, French & German]. Hamburg: Friederichsen de Gruyter & Co. [4to] [RM.40].

This is the second Festschrift compiled in honour of Prof. Bernhard Nocht, formerly director of the Institut für Schiffs- und Tropenhygiene at Hamburg. The first was on the occasion of his 70th birthday and this second one appears at his 80th birthday: it contains 116 articles on subjects of interest in tropical medicine, some being of veterinary interest. Abstracts of the latter will appear in the *Veterinary Bulletin*.—J. E.